WE DON'T HAVE AN ENERGY POLICY: THE LACK OF A COHESIVE AND OVERARCHING U.S. ENERGY POLICY AND ITS EFFECTS ON U.S. ENERGY SECURITY

by
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Abstract

This thesis explores the effects of the U.S. using different definition and concepts of energy security on policy. U.S. energy policy has long been characterized as being internally inconsistent, lacking coordination, and lacking long-term strategy. The project's overarching hypothesis is that without a definition or concept of energy security, U.S. energy security strategy will continue to be captured by special interests (both inside and outside of government), and U.S. energy policy will continue to lack cohesion and overall coordination. The paper's three chapters follow an identical format. A research question is posed, followed by an analysis. In Chapter 1, the thesis explores the effects of the Keystone XL (KXL) pipeline. Chapter 2 focuses on the effects on policy when the U.S. Department of Defense has defined and conceptualized 'energy security,' while Congressional jurisdictions with oversight have not conceptualized the term. The final chapter examines the agency that is assumed to be the driver of energy policy, the U.S. Department of Energy, and how it affects the development of U.S. energy policy. The results of this paper indicate that the criticism of U.S. energy policy is well deserved, as it is inconsistent, contradictory and lacks a long-term vision. This thesis proposes that the reason for such a lack of consistency or long-term strategy may be linked to the lack of a conception or definition of 'energy security.' At the conclusion of the thesis, policy recommendations are made, as well as suggestions for future areas of study on the topic.

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Introduction

The U.S. has been trying to craft a national policy to increase its 'energy security' or 'energy independence' ever since the 1973 Arab Embargo. For much of this time, the U.S. has struggled with energy policy aimed at increasing energy security. While the U.S. has passed major pieces of legislation aimed at increasing energy security or energy independence, the U.S. has found itself repeating the process with each change in administration.

Despite a plethora of legislation bearing the words "Energy Independence" or Energy Security" in their titles, little seems to change when it comes to measuring whether the legislation has the intended effect of actually increasing U.S. energy security. This may be in part because no legislation, or federal agency overseeing energy policy, has bothered to first define and conceptualize what, exactly, energy security is to the U.S.

While the term 'energy security' is elusive, it is nevertheless important to come to a consensus of its meaning and definition, in order to create a cohesive, clear, well-defined strategy that is consistent yet flexible when needed to respond to the constantly changing and unpredictable commodity that is energy. The importance of energy is well understood. It is the lifeblood of the U.S. economy, and carries with it military, political, and social ramifications. It is therefore imperative to have an energy security strategy in place for the nation.

This thesis examines the non-conceptualization of 'energy security' surrounding U.S. energy policy, and its effects on the ability of the U.S. to have an effective national energy security strategy. The paper endeavors to add to the limited body of work on how different definitions or concepts of 'energy security' within a government will create policies that lack cohesion and are often inconsistent or at odds with each other. When a government fails to conceptualize energy security, it leaves a vacuum which may be filled either by special interests or politicians with narrow political agendas. Each chapter of this thesis will examine a current conflict involving the issue of 'energy security,' and how a conceptualization of the issue may have averted the policy conflict.

Chapter 1 of this portfolio examines the Keystone XL Pipeline (KXL), an issue that has been in the news for several years now. At issue is the assertion by the pipeline's owner, TransCanada, that KXL will increase the 'energy security' of the U.S. TransCanada offers no way of measuring this objectively, and merely relies on the key words of 'energy security' to pressure the U.S. government into approving the project. Since the U.S. Department of State, in charge of approving the project, has no definition, concept, or long-term strategy for U.S. energy security, a simple concept of the term is used, one which takes into account Availability, Affordability, Energy & Economic Efficiency, and the Environment. The ability of KXL to increase U.S. energy security is then analyzed using this common concept of the idea, since the U.S. agency in charge lacked one.

Chapter 2 of this portfolio continued to explore the idea that in order to have an effective and cohesive energy strategy, a concept of the term must first be established. In the second chapter, the new DOD Energy Strategy is examined, in which the DOD has defined and conceptualized energy security for the first time. Recognizing the overreliance and vulnerability such reliance on fossil fuels presents to the military both at home and at military bases abroad, the DOD has sought to diversify its fuel source based on its new concept of 'energy security.'

However, despite recognizing vulnerabilities and making policy changes to minimize threats presented by fossil fuels, DOD has received massive pushback from Congress regarding its investment in biofuels. This thesis posits that the pushback from Congress is the result of the lack of a definition or conceptualization of the term from the various committees that have jurisdiction over energy policy. Chapter 2 examines this conflict in an attempt to better understand the standoff.

Chapter 3, the final chapter in this portfolio, examines the role of the U.S. Department of Energy (DOE) in creating national energy policy. As the only executive level cabinet agency with 'energy' in its title, an analysis of energy security would not be complete without examining the DOE. The origins of the DOE are examined, as well as the DOE budget, to see if its budget priorities reflect the mission of the department, and are oriented in a way as such to allow the department to coordinate and oversee a cohesive national energy security strategy.

The idea of 'fragmentation' is discussed, in which policy is so fragmented by different, competing centers of power as to make policy ineffective. This is accompanied by charts that illustrate just how fragmented energy policy in the U.S. is. In a rather surprising finding, the analysis presented finds that the DOE is not the driver of energy policy as it should. As a result, energy policies by other, various agencies are often contradictory and at odds with each other.

Finally, an overarching conclusion is presented that summarizes the portfolio's findings, and recommends areas for future study. The findings of the last chapter help to inform the first two chapters, and bring the larger issues prohibiting the formulation and implementation of a national energy security strategy to light. Additionally, the final pages are used to propose a few policy recommendations based on the findings of the analysis within the context of this thesis.

Chapter 1: How Will The Keystone XL Pipeline Affect U.S. Energy Security?

Introduction

September 2012 marked the 5-year anniversary of TransCanada's application to build the Keystone XL pipeline (KXL), a 1,179-mile long pipeline that would ship Canadian heavy crude oil to the U.S. Gulf Coast for refining. A decision to allow the construction of the pipeline has still not been reached, highlighting the contentious debate surrounding the pipeline, and whether the pipeline can have a positive affect on U.S. energy security. One reason a decision has still not been reached may stem from the lack of a single, cohesive, and conceptualized definition from the U.S. government of the term 'energy security' from which to make such policy decisions. Added to this lack of a common concept are the competing government institutions given authority over the KXL pipeline approval process having different concepts of energy security and differing policy goals, in this case between the U.S. Congress and U.S. Department of State. This chapter will examine the competing concepts and lack of 'energy security' definitions in the U.S. Congress and U.S. Department of State, and the implications this poses for the KXL pipeline and U.S. energy policy.

An often-repeated refrain from proponents of the KXL pipeline is that the pipeline is in the national interest of the U.S., and will help increase U.S. energy security. TransCanada has stated in its Presidential Permit Application that it is in the national interest of the U.S. to build the KXL pipeline, and further states that the pipeline would

reduce U.S. reliance on oil imports from countries such as Venezuela, Mexico, the Middle East, Africa, and other unstable regions.[1] Recent turmoil in Venezuela and the Middle East, combined with the long-held political desire to wean the U.S. from Middle Eastern oil and achieve energy independence makes such an argument appealing.

This chapter will seek to explore what effects the lack of a conceptualization of the term 'energy security' has on U.S. energy policy, through the prism of the KXL pipeline. First, a literature review will present an overview of the competing definitions and concepts of energy security. This is necessary in order to frame the current debate surrounding the KXL pipeline that will allow an analysis of the pipeline's effects on U.S. energy security. The analysis from the literature review will allow this chapter to answer two key questions: How will the KXL pipeline affect U.S. energy security? As will be outlined in a case study of the pipeline, the KXL pipeline will not have a positive effect on U.S. energy security. Secondly, how has the inability of the U.S. government to define a single concept of energy security affected U.S. energy policy? Unsurprisingly, the answer is negative. The lack of conceptualization of the issue has allowed special interests to shape U.S. energy policy under the guise of 'energy security', and resulted in policy gridlock, which the KXL pipeline exemplifies. The literature review and the case study of the pipeline will present the overarching hypothesis of this chapter: Given the policy proposals coming from the current Administration and Congress regarding energy security, the U.S. government should have formulated a clear definition and conceptualization of energy security and should be enacting policies that reflect a

[1] TransCanada, *Presidential Permit Application*, May 4, 2012: 1-2, 9.

common goal of increasing U.S. energy security. Finally, the conclusion of this chapter will offer an analysis on how the KXL pipeline demonstrates that the U.S. government lacks a definition and conceptualization of 'energy security', allowing special interests to formulate U.S. energy policy that is not conducive to increasing U.S. energy security.

Literature Review

Introduction

In order to address these questions, the literature review will focus on analyzing the many diverse definitions and concepts of what 'energy security' is. The goal of this analysis is to provide a framework for a case study of the KXL pipeline, as well as U.S. energy security. This analysis will also highlight the different definitions of energy security that are used within the U.S. government, complicating the policies that the U.S. government pursues in its efforts to increase the nation's energy security.

What is energy security? A recent study found 45 definitions of the term 'energy security.'[2] Energy security has become a highly politicized and multi-faceted concept, and the 45 definitions found reflect this idea. The 45 definitions found diverge in scope and meaning, depending on what interest, agency, or government is defining the term. Langlois-Bertrand has suggested that the myriad of definitions for 'energy security' prevents a clear object from emerging, or even a definition at all.[3] Similarly, Alhaji believes that the concept of energy security is elusive, and finding a clear definition of the

[2] Benjamin Sovacool, *Defining, measuring, and exploring energy security*, Routledge Handbook of Energy Security, ed. Benjamin Sovacool, (Abingdon, Oxon: Routledge, 2011): 3.
[3] Simon Langlois-Bertrand, Defense R&D Canada, Centre for Operational Research and Analysis, *The Contemporary Concept of Energy Security*, 2010 (Ottawa, Canada): 6.

term is difficult.[4] Ciuta, on the other hand, believes that the pervasiveness of literature on the subject may have made the term 'energy security' meaningless.[5] However the term may be defined, as a definition and concept of the term is necessary for policy. At its most basic, policy implies purpose in an issue. In order for a government to develop a comprehensive and cohesive response to an issue, it must first define and conceptualize the issue. In this case, it is necessary for the U.S. to define and conceptualize the term 'energy security' so that it may develop a proper response to the issue. Alhaji believes such a definition is difficult because energy security is a cross between several policy areas, including economic and environmental policy, among others.[6] However, to believe that the term is meaningless is unfounded; if the U.S. is to develop a cohesive energy policy response to increase the nation's energy security, it must first define and conceptualize the subject. Failure to conceptualize the issue may allow special interests to formulate policy that is not conducive to increasing U.S. energy security, and also result in policy gridlock.

For decades, much of the developed world used a simple, narrowly defined definition for energy security, defined as the availability of sufficient supplies at affordable prices.[7] Traditionally, this has only been in reference to oil, the world's most valuable traded commodity. When discussing energy security, Mulligan argues that the

[4] A F Alhaji, "What is Energy Security? (Part III)," petroleumworld.com, last modified November 11, 2007, http://petroleumworld.com/SF07111101.htm.
[5] Felix Ciuta, "Conceptual Notes on Energy Security: Total or Banal Security?" *Security Dialogue*, April 2010: 125.
[6] Ibid.
[7] Daniel Yergin, "Ensuring Energy Security," *Foreign Affairs* 85, No. 2 (2006): 70.

perspective of the state is the most relevant.[8] For states, the core concern regarding energy security relies in the relationship between securing energy and state security.[9] For states in the modern era, power is derived and directly related to energy availability, in both military and economic dimensions. This was true during much of the past century, as energy was a focal point in many conflicts.[10] The OPEC oil embargo during the 1970s demonstrated the vulnerability of economies to energy supply disruptions, and thus made the supply of energy a concern of national security for states. During the 1980s and 1990s, the emergence of environmentalism added another dimension to energy security.[11] The dimension of environmentalism is still associated with energy security, and is now considered in terms of sustainability and the impact on the environment from which energy is drawn from.

In order to maintain energy security today, according to Yergin, nations must follow several principles.[12] A well-known principal includes the diversification of supply. Contemporary experience, Yergin argues, has highlighted the need for new principles to guide energy security, which include recognition of the global energy security system, and acknowledgement that the entirety of the energy supply chain needs protection.[13] Yergin's acknowledgement of multiple principals guiding energy security is an echo of Alhaji's assertion that energy security cuts across several policy areas. The

[8] Shane Mulligan, *The Changing Face of Energy Security*, Prepared for the 80th Annual Conference of the Canadian Political Science Association, Vancouver, BC, 4-6 June 2008: 4.
[9] Ibid.
[10] Ibid.
[11] Ibid. 7.
[12] Yergin, *Ensuring Energy Security*, 75.
[13] Ibid. 76.

multiplicity of factors to consider in such a definition only lends credence to the complexity and politicization of the issue, as it entails multiple policy areas.

The multitude of meanings has also contributed to niche concepts and definitions of energy security, placing primacy on one dimension of the definition over others, often at the expense of a narrow view of the issue. Müller-Kraenner suggests that energy security has a different meaning for each country.[14] This implies that there exist different interpretations of security, depending on whether a nation is an importer or exporter of energy (oil). To support this, Yergin argues that energy-exporting countries define security in terms of "security of demand."[15] For countries that rely on petroleum exports for government revenue, this is of particular concern.

On the other hand, there is the "security of supply" for energy-importing countries. To this end, nations seek diversification in energy suppliers and sources.[16] The security of supply can be further broken down into contingent and structural risks. Contingent risks are considered to be major threats to supply security, and include unpredictable events, whether those events are political, military, or facility and transportation accidents.[17] Structural risks to supply include the possibility of a "producers' embargo."[18] The most well known 'producers embargo' was the OPEC embargo of the 1970s. Despite the juxtaposition of the two terms, the security of demand is equally important as the security of supply.

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[14] Sascha Müller-Kraenner, *Energy Security: Re-Measuring the World* (London: EarthScan, 2008): 20.
[15] Yergin, *Ensuring Energy Security*, 71.
[16] Ibid.
[17] Ken Koyama, "Risk and Uncertainty in the Changing Global Energy Market: Implications for the Gulf," Abu Dhabi: Emirates Center for Strategic Studies and Research, 2004: 81.
[18] Ibid. 82.

Fried and Trezise have a narrow view of the concept of energy security, and assert that increased security in oil is not the same as greater self-sufficiency in domestic production. Rather, the authors argue that security is in "avoiding sudden, substantial, and potentially prolonged rise" in the price of oil.[19] Such a narrow view may be appropriate, considering that there is only one market for oil, and it is the global market. As Yergin notes, security resides in the stability of this market for every country.[20] Petroleum was the most-consumed energy source in the U.S. in 2011.[21] For a nation that consumes such a large amount of petroleum, price stability would seem to play a large part in its definition and concept of energy security. However, such a narrow view of energy security is inappropriate. Today, there are many sources that nations derive their energy from, and oil is but one source of energy.

Despite the abundance of scholarly literature pertaining to the subject of energy security, there is a weakness in the literature that is reflected by the absence of discussion on the impact of a lack of a definition and conceptualization of 'energy security' from the government, and the inconsistent energy policies that are a result of this lack of conceptualization. Ciuta suggests that this lack of understanding affects not only how energy policies are pursued, but also how actors think about security.[22] There is no better example of this than the U.S. government, which has varying concepts and definitions of 'energy security' ranging from various departments, agencies, and branches of government, including Congress, the Department of Defense, the Department of State,

[19] Edward Fried and Philip Trezise, *Oil Security: Retrospect and Prospect* (Washington, DC: Brookings Institution, 1993): 4.
[20] Yergin, *Ensuring Energy Security*, 76.
[21] "U.S. Energy Consumption," U.S. Energy Information Administration, accessed March 18, 2013, http://www.eia.gov/todayinenergy/detail.cfm?id=9210.
[22] Ciuta, *Conceptual Notes on Energy* Security, 124.

and the Department of Energy. The U.S. Congress has never defined the term 'energy security'. The U.S. Department of State, however, defines the term as "having access to secure, reliable, and ever-cleaner sources of energy."[23] Another U.S. Government entity, the Department of Defense, defines the term differently yet again: "having assured access to reliable supplies of energy and the ability to protect and deliver sufficient energy to meet operational needs."[24] The Department of Defense's definition and concept of the term will be explored more thoroughly in Chapter 2. Further still, two recent legislative bills totaling over 1,500 pages directly tied to energy policy and energy security failed to define or conceptualize the term.[25]

Each definition defines 'energy security' in broad, ambiguous terms, with little tangible direction. They also leave uncertain policy choices. What is "affordable"? What is "abundant"? How does one measure the impact on the environment? Many of the broad principals offered in the various definitions by U.S. government entities, such as affordability, abundance, and the environment are incompatible with one another. For example, an energy source such as oil might be abundant, yet it may also be a leading contributor of greenhouse gasses and climate change. The U.S. Congress may push for an energy policy that is favorable for an abundant source of dirty energy, but that may conflict with another energy policy objective, such as the State Department's mission of "ever-cleaner" sources of energy. It may also be incompatible with itself, as an abundant or affordable energy might have a detrimental impact on the environment. How then do

[23] U.S. Department of State, Bureau of Energy Resources, http://www.state.gov/e/enr/.
[24] U.S. Department of Defense, *Quadrennial Defense Review*, (Washington, DC: 2010): 87.
[25] Sovacool, *Defining, Measuring, and Exploring Energy Security*, 3.

you define, measure and reconcile a multifaceted concept that has implications for many different policy areas?

One innovative approach has been developed by Jonathan Elkind, a former assistant secretary at the U.S. Department of Energy. Elkind asserts that energy security is composed of four components: availability, reliability, affordability, and sustainability.[26] What makes Elkind's method innovative is that the four components to his concept correspond to threats posed to energy security. This allows for the concept of 'energy security' to cut across different interconnected policy areas, from energy production to consumption, while allowing the concept to remain meaningful. Like Elkind, Sovacool and Brown also believe in a four-part concept of energy security. Sovacool and Brown's concept of energy security closely mirrors that of Elkind, and includes the interconnected dimensions of availability, affordability, efficiency, and environmental stewardship.[27]

Sovacool and Brown point out the need for taking a holistic approach when dealing with energy security, as when a country pursues one dimension of security, it often comes at the expense of the other three.[28] As the literature review has demonstrated, it will be necessary for the U.S. to first offer a single, coherent definition and concept of 'energy security' for U.S. energy policy to be successful, and prevent special interests from formulating energy policy to the detriment of other U.S. energy policy objectives. The KXL pipeline is illustrative of an inherent policy conflict as a

[26] Sovacool, *Defining, Measuring, and Exploring Energy Security*, 8.
[27] Benjamin Sovacool and Marilyn Brown, "Competing Dimensions of Energy Security: An International Perspective," Annual Review of Environment and Resources Vol. 35 (2010): 81.
[28] Ibid. 85.

result of a lack of clarity of what exactly increases U.S. energy security. The case study presented in this chapter will examine the conflict between differing concepts between competing U.S. government institutions of the term, the special interest that is behind the KXL, and the policy gridlock that is the result. For the purposes of my research, this paper examines the KXL pipeline as a case study using Sovacool and Brown's dimensions of energy security to identify the effects the pipeline will have on U.S. energy security, in order to identify and measure TransCanada's claim that the pipeline will increase U.S. energy security. The case study will also serve as a test concept for a U.S. concept for 'energy security' through which energy proposals could be examined and measured to gauge whether or not a policy will increase U.S. energy security.

Case Study: The Keystone XL Pipeline

Introduction

The following case study contains four sections, one section for each of Sovacool and Brown's dimensions of energy security including availability, affordability, energy and economic efficiency, and environmental stewardship. Each dimension will be measured by an indicator of energy security appropriate for that criterion of energy security. Following each section of analysis will be a brief conclusion, summarizing each section's finding of the effect that the KXL pipeline will have on the particular dimension of energy security being analyzed.

Availability

Availability, in terms of energy security, is associated with procuring a sufficient and uninterrupted supply, and minimizing foreign dependency on fuels.[29] Historically, there is a high cost associated with foreign dependency. The best-known example of the high cost of foreign dependence on foreign oil for the U.S. was the OPEC embargo during the 1970s. The embargo drastically cut supplies of oil to the U.S., thus resulting in high gas prices and rationing of gas. Energy suppliers from Russia to Venezuela have increasingly been willing to use energy resources as a tool to accomplish strategic and political objectives. Energy importing nations are finding that high dependence on foreign energy increases strategic vulnerability, while simultaneously constraining the ability to pursue broad foreign policy objectives.[30] Both of these examples illustrate the definition of 'availability' and its importance to energy security – uninterrupted supply and minimal foreign dependency.

An important aspect of availability is 'diversification'. Through diversification, a nation can attain a sufficient supply of energy to avoid a possible disruption with one source of energy, while minimizing dependence on any single nation as the source of its energy supply. From diversification, it is thought that it could then be possible to avoid the crippling effects of an embargo, as experienced in the 1970s, and to avoid having your energy needs used as a weapon against you, as Russia has done in Europe.

[29] Sovacool and Brown, *Competing Dimensions of Energy Security*, 81.
[30] Council on Foreign Relations, *National Security Consequences of U.S. Oil Dependency*, (New York: November 2006): 3.

According to Sovacool and Brown, diversification encompasses three dimensions: source diversification, supplier diversification, and spatial diversification.[31] Source diversification includes using different energy sources and fuel types; supplier diversification refers to the need to develop multiple points of energy production; and spatial diversification refers to the location of energy producing infrastructure and facilities.[32] Key indicators for energy security involving availability include oil import dependency and dependence on oil for transport.[33]

Source Diversification

Source diversification is the utilization of many different energy sources to provide energy services. Energy sources can include fossil fuels such as petroleum and coal, nuclear; renewable energy sources including wind, solar and biofuel; and natural gas. Currently, the U.S. energy portfolio is made up from (in descending order, from largest to smallest) petroleum at 36%, natural gas at 25%, coal at 20%, renewable sources at 9%, and nuclear at 8%.[34] In terms of energy consumption by sector, electric power is the largest at 41%, followed by transportation at 28%, industrial at 21%, and residential and commercial at 11%.[35] Despite electric power being the largest sector for energy consumption in the U.S. as a percent of total energy use, the sector uses no petroleum. Instead, the sector constituting the largest amount of U.S. energy consumption derives its energy from a mix of sources, including coal, nuclear, natural gas, and renewable

[31] Sovacool and Brown, *Competing Dimensions of Energy Security*, 81.
[32] Ibid.
[33] Ibid. 87.
[34] Branko Terzic, "Energy Independence and Security: A Reality Check," Deloitte University Press, 2012: 16.
[35] Ibid. 5.

sources. The transportation sector, on the other hand, is almost entirely supported by petroleum, with 93% of the sector's total energy use coming from petroleum.[36] In terms of availability, this is an indicator of energy security that needs to be improved.

The KXL pipeline then, with its promise to deliver more than 830,000 barrels of oil per day (bpd) to the U.S., would only serve to increase the largest energy source within the U.S. energy portfolio, petroleum. Additionally, the supply of petroleum from the KXL pipeline would provide more petroleum for consumption by the transportation sector. At 93% of the energy source used for transportation, this would only increase the risk to energy security by providing a cheap and reliable source of energy, giving little incentive to diversify the energy sources used to fuel the transportation sector. Despite U.S. energy coming from a variety of sources, over reliance on petroleum in the transportation sector, coupled with the lack of diversification efforts, makes the KXL pipeline the wrong infrastructure project in the effort aimed at source diversification.

Supplier Diversification

Supplier diversification is the effort to develop multiple sources of energy suppliers to minimize dependence on any single supplier or foreign nation for oil. An indication of a nation's supplier diversity is measured by its oil import dependency. Contrary to popular belief, the U.S. supply portfolio is quite diverse, as the U.S. imports petroleum products from more than 80 nations.[37] Additionally, the U.S. imports less than

[36] Ibid.
[37] "U.S. Oil Imports," U.S. Energy Information Administration, accessed June 10, 2013, www.eia.gov/tools/faqs/faq.cfm?id=727&t=6.

half of the petroleum it consumes - 45%, while the remaining 55% of the petroleum consumed in the U.S. is domestically produced.[38]

TransCanada has asserted in its Presidential Permit Application that it will be in the 'national interest' of the U.S. to allow the construction of the Keystone XL Pipeline, as the pipeline would allow for the U.S. to reduce its reliance on crude oil from Venezuela and Mexico in particular, and the Middle East and Africa in general. TransCanada asserts that Canadian oil is 'secure and reliable,' while crude oil from Venezuela, Mexico, etc. is neither secure nor reliable. Taken together, this implies that the KXL pipeline will help reduce U.S. oil import dependency. In the absence of a concept for 'energy security', it makes the claim from the special interest, TransCanada in this case, difficult to disprove. However, if the goal of supplier diversification is to increase the number of suppliers that supply the U.S. with petroleum, then the KXL pipeline would fail in this regard. Currently, of the 45% of petroleum the U.S. imports, 25% comes from Canada.[39] That is, Canada is already the largest supplier of petroleum to the U.S. Further, it is unclear why TransCanada labeled Mexican oil as unsecure and unreliable. The government of Mexico is democratic and not hostile to the U.S. as opposed to other countries the U.S. imports oil from, namely Venezuela. Despite violence related to drug cartels in Mexico, this has not caused a disruption in Mexican crude oil output. Mexican crude oil is considered a secure source of supply, as Mexico supplies the U.S. with 12% of the petroleum it imports.[40]

[38] Terzic, *Energy Independence and Security: A Reality Check*, 16.
[39] Ibid.
[40] Ibid.

Despite TransCanada's claims that the KXL pipeline will allow the U.S. to reduce its dependence on foreign oil from such places as the Middle East and Africa, the process of substituting petroleum from one country with petroleum from another country is not as straightforward as TransCanada would have one believe. There are many different types of crude oil produced around the world, as crude oil produced in different geographical locations will have its own unique properties. In general crude oil has been grouped into 4 main classes (Very Light, Light, Medium, and Heavy) based on certain quality characteristics, the most important being density and sulfur content. Crude oil that is light, i.e. a low density, and sweet, i.e. low sulfur content, are the most desirable due to the fact that light sweet crude oil can be produced far cheaper and with less energy-intensive refining processes than heavy, sour crude oils.[41]

The markets with the refining capacity to process heavy crude are therefore limited, based on the complex processes and equipment, along with the more energy-intensive refining. The proposed KXL pipeline will carry Canadian heavy crude oil to the U.S. Other countries that the U.S. imports heavy crude from include Venezuela and Mexico, two countries that TransCanada specifically mentioned in its application. Both Venezuela and Mexico are important oil suppliers to the U.S., supplying 10% and 12% respectively, of the oil the U.S. imports. The only other countries that supply more oil to the U.S. are Canada and Saudi Arabia. Since refining capacity for heavy crude is limited, the decision to allow the KXL pipeline will likely displace the crude oil currently

[41] "Crude Oil Characteristics," U.S. Energy Information Administration, accessed June 10, 2013, http://www.eia.gov/todayinenergy/detail.cfm?id=7110.

imported from both Venezuela and Mexico, as they also supply the U.S. with heavy crude.

Other suppliers of crude oil that TransCanada mentions in its application, from the Middle East and Africa are unlikely to be affected, as they do not supply the U.S. with heavy crude. Countries such as Saudi Arabia (which is the second largest source of U.S. petroleum imports at 13%), Iraq (5%), Nigeria (9%), and Angola (4%) do not produce heavy crude.[42] Instead, those countries produce the light, sweet crude that is desirable because of its quality. Construction of the KXL pipeline then will have little to no effect on U.S. dependency of oil imports from countries in the Middle East or Africa. Moreover, despite any misgivings regarding the governments of Venezuela and Mexico one has, one cannot argue that either country's oil has been unsecure or unreliable for the U.S. Both countries have long been reliable suppliers of crude oil to the U.S., and will continue to be so for the foreseeable future at current rates of importation.

The largest misconception about the KXL pipeline however, is the belief that the heavy Canadian crude oil it will carry to the U.S. is actually intended for U.S. consumption. During a U.S. House of Representatives Committee on Energy and Commerce hearing on December 2, 2011 regarding the KXL pipeline, Congressman Ed Markey (D-MA) pressed TransCanada executive Alex Pourbaix to support legislation guaranteeing oil from the KXL pipeline would not be for foreign export once refined in the U.S. In response, Mr. Pourbaix asserted that TransCanada was only shipping the oil, and could not guarantee the crude shipped through the pipeline would be used to reduce

[42] Terzic, *Energy Independence and Security: A Reality Check*, 16.

U.S. crude imports from elsewhere.[43] If the crude oil that is to be brought to the U.S. from Canada via the KXL pipeline is not meant for the U.S. market, then the pipeline would fail to have a positive effect on U.S. efforts to diversify its supplier portfolio. Further, it significantly raises questions about the claims TransCanada has made in its Presidential Permit Application regarding the benefits to U.S. energy security from the construction of the KXL pipeline, including the claim to reduce U.S. consumption of oil from unstable regions by as much as 40%.[44]

Spatial Diversification

Spatial diversification refers to the dispersing of critical infrastructure, so that no single terrorist attack, event, or failure can have a disruptive effect on a nation's energy supply. Energy infrastructure is equally as vulnerable as other critical types of infrastructure.[45] Pipelines in particular often cover long, sparsely populated distances, and are often time consuming and expensive to repair if damaged.[46] In the case of the KXL pipeline, this is of particular importance.

When completed, the KXL pipeline will be a 1,179 mile (1,897 km) long pipeline, making it not only one of the longest pipelines carrying oil in the U.S., but also one of the longest in the world. Additionally, the KXL pipeline will be one of the largest pipelines in the U.S. by capacity, carrying 830,000 bpd. Information about the planned pipeline is well disseminated throughout the Internet, and includes not only engineering information pertaining to the pipeline itself, but also detailed maps showing exactly where the

[43] U.S. House of Representatives, Committee on Energy and Commerce Hearing, *The American Energy Initiative, Part 14*, December 2, 2011: 103.
[44] TransCanada, Energy Security, accessed June 11, 2013, http://keystone-xl.com/about/energy-security/ .
[45] Müller-Kraenner, *Energy Security: Re-Measuring the World*, 22.
[46] Ibid. 23.

pipeline will be laid. This would make it an attractive target to either acts of terrorism or sabotage.

Also of importance in regards to spatial diversification is where the pipeline ends, at Port Arthur, Texas. This is important due to the fact that the largest refinery by capacity is located in Port Arthur. In 2012, the refinery was upgraded, and now has a capacity to refine 600,250 bpd. The combination of the one of the largest oil pipelines in the nation with the largest refinery in the U.S. should be considered a high-value target for acts of terrorism or sabotage. Instead of making the goal spatial diversification, the U.S. will instead have provided a target that can greatly damage U.S. energy supply by grouping critical infrastructure together.

History provides a clear example of the possible acts of terrorism or sabotage aimed at critical infrastructure, specifically energy-related infrastructure. Such acts have occurred both in North America and throughout the world. In 1975, the New World Liberation Front sabotaged pipelines from the Pacific Gas and Electric Company in California.[47] While such acts are rare in the North America, the U.S. is not immune to such acts of sabotage aimed at critical energy infrastructure. More often, terrorist acts aimed at energy infrastructure occur overseas. For the sake of brevity, only a few demonstrative examples will be listed.

[47] Sovacool and Brown, *Competing Dimensions of Energy Security*, 82.

In January 2013, an Islamist terror group infiltrated an Algerian gas plant at In Amenas, killing dozens of hostages and destroyed critical infrastructure.[48] Attacks against energy infrastructure have turned to cyberspace, representing another possible vulnerability to critical infrastructure. Saudi Aramco, Saudi Arabia's largest oil company, suffered a cyberattack that damaged 3,000 computers, and was aimed at stopping oil and gas production.[49] This same vulnerability may also exist with the KXL pipeline and Port Arthur refinery infrastructure. The KXL pipeline will have no effect in assisting the U.S. at spatial diversification. Instead, the pipeline will increase the value of itself as a high-value target for acts of terrorism or sabotage.

Measuring the KXL pipeline by Congressional proclamations of 'energy independence' and 'energy security' make the project sound attractive. The special interest driving the KXL policy proclaims that it will cut U.S. oil imports from hostile nations, and is from a friendly and reliable country, Canada. If one had a checklist, it would appear that the KXL pipeline would meet critical criteria, according to the U.S. Congress, of what it takes to improve U.S. energy security. TransCanada, for its part, has relied heavily on this perception in attempts at lobbying Congress and the State Department to approve the pipeline. However, as this analysis shows, there is little that the KXL pipeline will do in terms of improving U.S. energy security in the dimension of availability. Instead, a lack of conceptualization on the part of U.S. energy policy has

[48] Mohamed Arezki Himeur, "In Amenas siege: Is Algeria's economy under threat?" *BBC* News, January 25, 2013, http://www.bbc.co.uk/news/world-africa-21186272.
[49] "Aramco Says Cyberattack Was Aimed at Production," *New York Times*, December 9, 2012, http://www.nytimes.com/2012/12/10/business/global/saudi-aramco-says-hackers-took-aim-at-its-production.html?_r=0.

allowed a special interest to promote a policy that is not conducive with U.S. energy policy goals.

Affordability

The second component of energy security according to Sovacool and Brown is 'affordability.' Affordability is defined as providing energy that is affordable for consumers and minimizes price volatility. The authors note that there are two additional dimensions to affordability, they include price stability and quality. The focus of this analysis will be on the two dimensions of affordability and price stability. The indicator for affordability as energy security is retail gasoline prices. In June 2010, TransCanada directly declared via a study that the construction of the pipeline would lead to lower supply costs, and thus put downward pressure on gas prices that Americans pay at the pump.[50] Even U.S. politicians declared that the KXL pipeline would help bring down prices Americans pay at the pump.[51] Affordability is not only important for transportation, but can also indirectly increase the costs of other goods and services, as energy is responsible for up to 15% of the total cost of processing and production of goods.[52] Affordability is a key dimension to energy security, and TransCanada has stated that the KXL pipeline will lower gasoline prices, and thus make its crude oil more affordable for U.S. consumers.

[50] The Perryman Group, "The Impact of Developing the Keystone XL Pipeline Project on Business Activity in the U.S.," June 2010: 4.
[51] Glenn Kessler, "Will the Keystone XL pipeline lower gasoline prices?" *The Washington Post*, March 2, 2012, http://www.washingtonpost.com/blogs/fact-checker/post/will-the-keystone-xl-pipeline-lower-gasoline-prices/2012/03/01/gIQAtWkXlR_blog.html.
[52] Sovacool and Brown, *Competing Dimensions of Energy Security*, 83.

According to the U.S. Energy Information Agency, there are several factors that determine the price of oil. There is no single factor that determines the price of oil. Factors include supply, geopolitics, weather, demand, and market behavior, among others.[53] Additionally, because oil is a globally traded commodity, prices depend on how much is produced worldwide, not in any single nation.[54] Despite Canada increasing its oil production, and shipping its oil via the KXL pipeline to the U.S., other producing nations may simply decrease their production, thus cancelling out any drop in price that increased production may have yielded to the global supply of oil.[55] While U.S. consumption of oil is declining (At the end of 2013 China surpassed the U.S. as the largest net importer of petroleum), crude oil prices have continued to increase, reflecting increased global demand for crude oil, largely from strong economic growth in non-OECD nations such as China and India.[56]

More specifically then, what effect will the KXL pipeline have on U.S. gas prices, in the short-term and long-term? This is one of the most contentious points of debate about the KXL pipeline. Proponents of the pipeline argue that it will not have an effect on U.S. gasoline prices, while opponents of the pipeline claim that it will increase U.S. gasoline prices in the Midwest by diverting oil for refining to the Gulf Coast. Before declaring in 2010 that the pipeline would lower gas prices in the U.S., TransCanada officials in 2009 admitted that the KXL pipeline would actually increase the price of

[53] "What Drives Crude Oil Prices?" U.S. Energy Information Administration, accessed July 6, 2013, http://www.eia.gov/finance/markets/.
[54] Michael Levi, "Why more U.S. oil may not mean cheaper U.S. gas," *Bloomberg*, April 16, 2013, http://mobile.bloomberg.com/news/2013-04-16/why-more-u-s-oil-may-not-mean-cheaper-u-s-gas.html.
[55] Ibid.
[56] CalTex, Determining Fuel Prices, http://www.caltex.com/global/resources/determining-fuel-prices/.

crude oil in the U.S., not decrease prices. It is important to examine the previous claim of the pipeline actually increasing oil prices in the U.S., as it directly affects the affordability dimension. For the more obvious reasons, TransCanada's declaration of downward pressure in gas prices in the U.S. can be explained from a populist perspective, and is therefore less relevant than their previous statements to the contrary.

In September 2009, executives of TransCanada testified before the Canadian National Energy Board. In their testimony, the TransCanada executives claimed that the KXL pipeline would allow the end of discounting Canadian crude currently shipped to the U.S. Midwest for refining.[57] Currently, the Midwest refining market is suffering from over-supply of Canadian crude as a result of rising oil production from Canada, combined with limited southbound pipe capacity.[58] The result of this market imbalance has been a discount for refiners of Canadian crude that serve the 14 state Midwest market. The KXL pipeline would then correct this market imbalance, and would allow the oversupply of Canadian crude to be shipped to the Gulf Coast. The result of the correction of this market imbalance would be an increase in the price of gas that U.S. consumers pay in the Midwest. It has been estimated that this market correction will increase the cost of gas for consumers in the Midwest anywhere between 10-20 cents more per gallon.[59]

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[57] Canadian National Energy Board, *Hearing In The Matter of the TransCanada Keystone Pipeline*, (Calgary, Alberta: September 17, 2009): 90-92.
[58] Neelesh Nerurkar, "U.S. Oil Imports and Exports," *Congressional Research Service Report*, (Washington, DC: April 4, 2012): 27.
[59] Philip Verleger, "If Gas Prices Go Up Further, Blame Canada," *StarTribune*, March 13, 2011, http://www.startribune.com/opinion/commentaries/117832183.html.

Price Stability

As a part of affordability, energy prices should also be stable and minimal in price volatility. Consumers in the U.S. are aware of the volatility in the price of oil. Even reductions in oil imports will not shield U.S. consumers from the global market price of oil.[60] It is therefore difficult to argue that the KXL pipeline, while increasing the U.S. import of oil, would act as a shield against future price fluctuations in oil in the long-term. Most of the volatility in the price of oil is the result of geopolitical instability, which can easily increase the price of oil from uncertainty in the market.

Two recent examples are illustrative of the disrupting and far-reaching effect that geopolitical instability can have on the price of oil, despite the U.S. importing very little oil from the country involved in the geopolitical instability. Libya produces 1.8m bbl/d of crude oil, and exports approximately 1.5m bbl/d, mainly to Europe. Libyan oil production totals less than 1% of the roughly 86m bbl/d global oil market.[61] The U.S. imported only 15k bbl/d of crude oil from Libya in 2011.[62] Despite the limited amount of crude oil the U.S. imported from Libya, the geopolitical unrest in Libya during 2011 caused U.S. gas prices to increase 33 cents in two-weeks, the second largest two-week increase in the history of the gasoline market.[63] Similarly, Egypt produces a small percentage of the total global output, about 550,000k bbl/d. Of Egypt's crude oil

[60] International Energy Agency, *World Energy Outlook 2012 Executive Summary*, (Paris, France: 2012): 2.
[61] Michael Ratner and Neelesh Nerurkar, "Middle East and North Africa Unrest: Implications for Oil and Natural Gas Markets," *Congressional Research Service Report*, (Washington, DC: March 10, 2011): 2.
[62] "Libya," U.S. Energy Information Administration, accessed July 20, 2013, http://www.eia.gov/countries/cab.cfm?fips=LY.
[63] Mariano Castillo, "Libya Crisis Sends U.S. Gas Prices Up 33 Cents in Two Weeks," *CNN*, March 7, 2011, http://www.cnn.com/2011/TRAVEL/03/06/gas.prices/index.html.

production, the U.S. imports only 31,000k bbl/d from Egypt.[64] Like Libya two years ago, geopolitical unrest is threatening to increase the global price of crude oil, with the trickle down effect of increasing U.S. gasoline prices. The rising tensions in Egypt have pushed U.S. crude prices to over $100 a barrel, the highest level in the past 14 months.[65]

Despite the short and long-term effects of the global supply and demand market on prices for crude oil, there are proponents that believe the KXL pipeline will increase the global supply of oil, and thus put downward pressure on crude oil prices.[66] When the KXL pipeline reaches its maximum capacity, it will carry roughly 0.8m bbl/d of crude oil, slightly less than 1% of global demand. Despite the increase in supply that the KXL pipeline would provide to the global market, it is unlikely to decrease the price of crude, as the world will continue to experience fluctuations in the price of crude oil.

Despite TransCanada's claim, the KXL pipeline will not lower consumer prices in the U.S. No single new development of oil can prevent fluctuations in the price, and the KXL pipeline will not be the first new development to do so. Instead, the pipeline project will have a marginal effect on the price of gasoline, and on the affordability of crude oil, in either the short or long-term. The KXL pipeline cannot act as a shield to protect U.S. consumers from the volatility of oil prices. As Yergin notes, there is only one oil market, and secession is not an option.[67]

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[64] "Egypt," U.S. Energy Information Administration, accessed July 20, 2013, http://www.eia.gov/countries/cab.cfm?fips=EG&src=home-b4.
[65] Talia Buford, "Egypt Hasn't Spoiled Gas-Price Dip – Yet," *Politico*, July 4, 2013, http://www.politico.com/story/2013/07/egypt-gas-prices-oil-93716.html?hp=t1.
[66] Nerurkar, *U.S. Oil Imports and Exports*, 27.
[67] Yergin, *Ensuring Energy Security, 76.*

Energy and Economic Efficiency

The third dimension to energy security according to Sovacool and Brown relates to energy efficiency. Energy efficiency is defined as enabling the most economically efficient use of energy to perform a certain task by minimizing the units of resources per unit of output.[68] Improving energy efficiency also includes substituting fuels, changing habits and preferences, or altering goods and services to demand less energy.[69] Improving energy efficiency therefore relates to the innovation, research, and development of new energy technology. Indicators for energy efficiency can include energy intensity, per capita electricity use, and the on-road fuel intensity of passenger vehicles.[70]

The KXL pipeline, as a piece of infrastructure, does not increase energy efficiency through innovation, research, or development. The pipeline also fails to increase energy efficiency as related to the ability to influence and change energy habits and preferences. Instead, the KXL pipeline would likely increase U.S. reliance on fossil fuels, if, according to TransCanada, the oil transported through the pipeline is destined for U.S. consumption, rather than alternative and substitute fuels, such as biofuels. While the indicators of energy security for energy efficiency cannot be applied to a piece of infrastructure such as a pipeline, evaluating the KXL pipeline through the dimension of energy efficiency provides further insight into the effects that it will have on U.S. energy security. By not improving either energy or economic efficiency, the KXL pipeline would fail in this dimension.

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[68] Sovacool and Brown, *Competing Dimensions of Energy Security*, 84.
[69] Ibid.
[70] Ibid. 87.

Environmental Stewardship

The final dimension of energy security according to Sovacool and Brown is environmental stewardship, which relates to the importance of sustainability. Sustainability, in the traditional sense, embodied the notion of balancing current resource consumption with future resource requirements.[71] In regards to energy security, a contemporary concept of sustainability includes pursuing three objectives: ensuring the harvest rates of renewable resources do not exceed regeneration rates; making sure that waste emissions do not exceed relevant assimilative capacities of ecosystems; and guaranteeing that nonrenewable resources are depleted only at a rate equal to the creation of renewable ones.[72] The U.S. State Department, while not explicitly defining 'sustainability', has included access, renewable energy, and efficiency as dimensions to sustainable energy.[73] The dimensions used by State Department are quite different, and it is worth questioning in what context State Department is using 'sustainability,' as it appears to not be in relation to 'energy security.' The indicators for environmental stewardship include aggregate sulfur dioxide (SO_2) emissions and carbon dioxide (CO_2) emissions. Since the KXL pipeline will carry oil, this case study will focus on the CO_2 emissions that will result from the Canadian tar sand oil the pipeline is to bring to market.

The most significant aspect to environmental stewardship is climate change. Organizations such as the International Energy Agency have recognized the link between climate change and energy security, and changing energy use is a key piece of trying to

[71] Ibid. 84.
[72] Ibid.
[73] U.S. Department of State, http://www.state.gov/e/enr/c56885.htm.

create any energy security policy.[74] The threat posed to energy security by climate change has also been recognized by former U.S. defense secretaries, and of the need to reduce greenhouse gases in U.S. energy policy.[75] Climate change acts as a "threat multiplier," in addition to the challenges to energy security, it will also create instability and challenges in areas such as food, water, health, and weather patterns.[76]

Climate change in particular will affect U.S. energy security, as climate change is seen primarily as a result from energy usage. Broadly speaking, when environmental conditions deteriorate, necessary energy resources may become unavailable, and may create conflict between nations over the remaining energy resources.[77] In particular, rising sea levels as a result of global warming will threaten U.S. energy infrastructure located along coasts.[78] This includes the oil refineries along the Gulf Coast, and the KXL pipeline, which will terminate at the Gulf Coast. Reducing carbon dioxide emissions, therefore, is a critical component to any energy security policy going forward. According to the latest figures available from the U.S. Energy Information Agency, in 2011, petroleum accounted for 36% of U.S. energy consumption, and 42% of energy-related CO_2 emissions.[79] Year over year, energy-related CO_2 emissions by the U.S. decreased by

[74] International Energy Agency, *Energy Security and Climate Policy*, (Paris, France: 2007): 28.
[75] Council on Foreign Relations, *National Security Consequences of U.S. Oil Dependency*, 11.
[76] Center for Naval Analysis, *Powering America's Defense: Energy and the Risks to National Security*, May 2009: 14.
[77] Marilyn Brown and Michael Dworkin, *The Environmental Dimension of Energy* Security, Routledge Handbook of Energy Security, ed. Benjamin Sovacool, (Abingdon, Oxon: Routledge, 2011): 176.
[78] Elkind, *Building a Secure Energy Future*, 5.
[79] "Environment," U.S. Energy Information Administration, accessed August 1, 2013, http://www.eia.gov/environment/emissions/carbon/.

2.4%, to 5.471 billion metric tons.[80] At this level, the U.S. ranks as the second largest contributor to CO_2 emissions worldwide, behind only China.[81]

Any possible benefits to U.S. energy security from the increase in supply from Canadian oil must be weighed against the increase in CO_2 emissions that would result from using more Canadian oil. In June 2013, President Obama, during a speech at Georgetown University, stated that he would oppose the KXL pipeline if it would "significantly" increase greenhouse gas admissions.[82] Therefore, the link between CO_2 emissions and approval for the pipeline is significant.

The U.S. Department of State has the authority of approving the KXL pipeline, because the pipeline crosses an international border, thus giving State jurisdiction over the matter. Part of State Department's evaluation process includes an Environmental Impact Statement, which is being conducted by the Environmental Protection Agency (EPA). The Environmental Impact Statement covers many factors, the most relevant to this research being CO_2 emissions from the oil that the pipeline will carry. The State Department's Bureau of Energy Resources (ENR) defines a part of 'energy security' as "ever-cleaner sources" of energy. While the EPA does not offer a definition or concept of 'energy security,' the EPA plays a critical role in energy policy in the U.S. For the EPA, this means a focus on "clean energy." The mechanism that grants the EPA such authority is from the Clean Air Act, a measure passed by Congress that regulates and limits pollutants in the atmosphere, including CO_2 emissions.

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[80] Ibid.
[81] European Commission, Joint Resource Centre, Emission Database for Global Atmospheric Research (EDGAR), http://edgar.jrc.ec.europa.eu/overview.php?v=CO2ts1990-2011&sort=des9.
[82] Andrew Restuccia, "On Keystone pipeline, Obama 'headed toward yes,'" *Politico*, July 30, 2013: 18.

The U.S. Department of State Environmental Impact Statement examined the issue of greenhouse gas emissions and Canadian tar sand crude. From the EPA, the study found that Canadian tar sand crude is more greenhouse gas intensive than other crude oil that it would displace in the U.S.[83] Another study, conducted by the Congressional Research Service, estimated that Canadian tar sand crude had the second highest CO_2 emissions among oil imported into the U.S., second only behind Venezuelan crude.[84] While the studies varied in their methodology and data used, both studies demonstrate the expected increase in CO_2 emissions from the KXL pipeline. Based on the above studies, importing more Canadian oil is not sustainable for the environment or U.S. energy policy goals.

The emphasis in this section was the focus of what the State Department conceptualizes as 'energy security.' The State Department, as well as the EPA, have placed more concern and focus on the environmental aspect of energy security than Congress has. Other than increased CO_2 emissions, part of the environmental concern also stems from the possible spill potential of pipelines. The KXL pipeline passes through environmentally fragile zones, including the Ogallala Aquifer. In 2013, an oil spill that went undetected from a pipeline in North Dakota leaked 865,000 gallons of oil, making it one of the largest inland oil spills in history.[85] TransCanada has re-submitted the planned route of the pipeline in the hopes of mitigating environmental concerns, however, a decision is still pending authorization for the pipeline to go ahead. Based on

[83] U.S. Department of State, *Final Environmental Impact Assessment for the Proposed Keystone XL Project: Executive Summary*, (Washington, DC: 2011): 15.
[84] Nerurkar, *U.S. Oil Imports and Exports*, 29.
[85] Dan Frosch, "Oil Spill in North Dakota Raises Detection Concerns," *New York Times*, October 23, 2013, http://www.nytimes.com/2013/10/24/us/oil-spill-in-north-dakota-raises-detection-concerns.html?_r=0.

these environmental impacts, the KXL pipeline would not have a positive effect on U.S. energy security in this dimension.

Conclusion

This chapter sought to determine how the KXL pipeline would affect U.S. energy security. The case study has found that despite previous beliefs in what the KXL pipeline would do for the U.S., many of the claims presented by TransCanada are false. The KXL pipeline will do little to improve U.S. energy security. The hypothesis at the beginning of this chapter inferred that the lack of a definition and conceptualization of 'energy security' has allowed special interests, in this case, TransCanada, to shape U.S. energy policy under the guise of 'energy security', and resulted in policy gridlock. The case study presented in this chapter has highlighted the vulnerability of U.S. energy policy to special interests. Without a defined concept of 'energy security', the U.S. cannot improve its energy security through cohesive and effective policy. Instead, special interests will fill the conceptual void, and drive U.S. energy policy in a direction that is beneficial not to the U.S., but to the bottom line of the special interest.

The case study in this chapter also highlighted the contradictions in policy that can arise when different government agencies use different concepts of 'energy security' to define and pursue policy objectives to increase the energy security of the U.S. While Congress is firm in its belief that the pipeline will increase U.S. energy security, from affordability, reliability, and diversification away from 'hostile nations' (despite the claims proven to be false in this case study), the State Department and EPA believe that the pipeline posses a threat to the U.S. environment and global climate change. Because

concepts and definitions of what exactly 'energy security' is conflict, the result is policy gridlock – final approval from President Obama has not yet been given. While a final decision on the pipeline is expected, it is likely that the President will approve of the pipeline, although from the analysis presented in this case study, it will not affect U.S. energy security in the way that the pipeline's proponents or Congress believes. This chapter has attempted to highlight the fact that regardless of whether or not the pipeline is approved, a cohesive U.S. concept and policy for energy security is lacking, and will continue to hamper future U.S. efforts at improving energy security through cohesive and effective energy policy.

Timeline of the Keystone XL Pipeline

September 19, 2008 – TransCanada submits an application to the U.S. Department of State to construct the Keystone XL pipeline, an extension of the existing Keystone pipeline.

2009 – Department of State conducts 20 scoping meetings in communities along the pipeline route and consults with federal and state agencies and Indian tribes.

April 16, 2010 – Department of State issues its Draft Environmental Impact Statement. It opens a 45-day comment period, which it extends for additional days.

Summer 2010 – Department of State hosts 21 public comment meetings in communities along the pipeline route. When the public comment period is extended, additional meetings are held. Nearly 1,800 verbal and written comments are received.

October 15, 2010 – Speaking to the Commonwealth Club of San Francisco, Secretary of State Hillary Clinton is asked about approval of the Keystone XL pipeline and she says, "we are inclined to do so."

October 25, 2010 – The General Presidents of four international unions representing a total of 2.6 million workers send a letter to Secretary of State Hillary Clinton urging the Department of State to approve the Keystone XL pipeline project.

December 7, 2010 – Department of State hosts a government-to-government meeting for Indian tribes and other consulting parties.

January 2011 – TransCanada agrees to adopt 57 project-specific special conditions for design, construction, and operations of the Keystone XL pipeline. The conditions are developed by the Department of State and the Pipeline and Hazardous Materials Safety Administration; according to the Supplemental Environmental Impact Statement, these conditions would give the Keystone XL pipeline "a degree of safety over any other typically constructed domestic oil pipeline," making it a truly state-of-the-art pipeline.

April 15, 2011 – Department of State issues a Supplemental Draft Environmental Impact Statement and opens another 45-day comment period. More than 280,000 comments are received.

July 25, 2011 – The Obama administration issues a Statement of Administration Policy calling legislation related to the Keystone XL pipeline unnecessary, declaring, "the Department of State has been working diligently to complete the permit decision process for the Keystone XL pipeline and has publicly committed to reaching a decision before December 31, 2011."

July 26, 2011 – U.S. House of Representatives approves H.R. 1938, the North American-Made Energy Security Act. The bill, authored by Rep. Lee Terry (R-NE), requires a decision on the

Keystone XL pipeline by November 1, 2011. The bill is approved with a strong bipartisan vote of 279-147.

August 26, 2011 – Department of State issues its Final Environmental Impact Statement and opens up a 90-day review period. The agency continues accepting public comments.

Fall 2011 – Department of State hosts public meetings in states along the pipeline route.

November 10, 2011 – President Obama announces that no decision on the Keystone XL pipeline will be made until after the 2012 election. A decision is expected in early 2013, after the administration identifies a new route for the pipeline.

November 10, 2011 – The president's decision is widely attributed to political pressure exerted by environmentalist groups opposed to the pipeline. A statement from Terry O'Sullivan, General President of the Laborers' International Union of North America, sums up the response: "Environmentalists formed a circle around the White House and within days the Obama administration chose to inflict a potentially fatal delay to a project that is not just a pipeline, but is a lifeline for thousands of desperate working men and women. The administration chose to support environmentalists over jobs – job-killers win, American workers lose."

December 23, 2011 – Both the House and Senate unanimously approve – and President Obama signs into law – a bill requiring approval of the Keystone XL pipeline within 60 days unless the president determines the project does not serve the national interest.

January 18, 2012 – After over three years of review, President Obama formally rejects the pipeline's Presidential Permit and asks TransCanada to reapply.

February 7, 2012 – The Energy and Commerce Committee approves H.R. 3548, the North American Energy Access Act. The bill, authored by Rep. Lee Terry (R-NE), removes the president's authority over the pipeline's permit and transfers it to the Federal Energy Regulatory Commission.

February 16, 2012 – U.S. House of Representatives approves the PIONEERS Act with language from Rep. Terry's bill requiring swift approval of the pipeline.

March 8, 2012 – President Obama personally lobbies the Senate to kill an amendment calling for congressional approval of the Keystone XL pipeline. In spite of the president's efforts, 11 Senate Democrats joined all voting Republicans in favor of the project.

March 22, 2012 – On a visit to Cushing, Oklahoma, President Obama takes undue credit for the southern leg of the pipeline from Cushing to the Gulf Coast, ignoring the fact that he rejected the only Keystone permit that requires his approval because it crosses our national boundary with Canada.

April 18, 2012 – House approves H.R. 4348, the Surface Transportation Extension Act of 2012, including language authored by Rep. Lee Terry (R-NE) taking the pipeline out of the president's hands and requiring the Federal Energy Regulatory Commission to approve the permit within 30 days. The bill passed with veto-proof support by a vote of 293-127.

April 18, 2012 – TransCanada submits a reroute of the Keystone XL plan to the state of Nebraska for review.

May 4, 2012 – TransCanada reapplies to U.S. State Department for a Presidential Permit.

May 18, 2012 – House passes a Motion to Instruct Conferees on H.R. 4348 to insist on Title II of the House bill regarding approval of the Keystone XL Pipeline. The motion passed with a bipartisan vote of 261-152.

June 15, 2012 – State Department publishes Notice of Intent (NOI) to prepare a Supplemental EIS (SEIS) for the second Keystone XL Presidential Permit application.

January 22, 2013 – Nebraska Governor Dave Heineman gives approval of the proposed reroute of the pipeline through the Cornhusker State. March 1, 2013 – The U.S. State Department issued its Supplemental Environmental Impact Statement for the Keystone XL Presidential Permit application, which includes the proposed new route through Nebraska. The SEIS findings are similar to the Department's FEIS issued last August, which found the pipeline will have limited adverse environmental impacts.

March 15, 2013 – H.R. 3, the Northern Route Approval Act, is introduced in the House by Rep. Lee Terry (R-NE). The bill addresses all the permits necessary beyond just presidential approval and would limit litigation that could doom the project.

March 22, 2013 – U.S. Senate agrees to Sen. John Hoeven's (R-ND) budget amendment urging approval of the Keystone XL pipeline by a vote of 62-37. 17 Democrats joined every Senate Republican voting in favor of the amendment, signaling future filibuster-proof support for legislation to build the pipeline using congressional authority. April 17, 2013 – The Energy and Commerce Committee approves H.R. 3, the Northern Route Approval Act, by a vote of 30 to 18.

May 22, 2013 – House approves H.R. 3, the Northern Route Approval Act, with bipartisan support by a vote of 241 to 175.

January 31, 2014 – The U.S. State Department issued its Final Supplemental Environmental Impact Statement for the permit application, confirming the project is safe and will have limited environmental impacts. The report reflects that TransCanada has agreed to incorporate 59 special safety conditions recommended by PHMSA.

April 18, 2014 – The U.S. State Department announced it will delay the national interest determination period indefinitely, citing a need to wait until the Nebraska Supreme Court can rule over the route.

September 18, 2014 – House approves H.R. 2, the American Energy Solutions for Lower Costs and More American Jobs Act, a broad energy package that includes the language of H.R. 3.

November 14, 2014 – House approves H.R. 5682, a bill authored by Rep. Bill Cassidy (R-LA), which would approve the application for the Keystone XL pipeline.

January 9, 2015 – House approves H.R. 3, the Keystone XL Pipeline Act, authored by Rep. Kevin Cramer (R-ND), which would authorize construction of the project.

January 29, 2015 – Senate approves S.1, the Keystone XL Pipeline Approval Act. February 11, 2015 – House approves S.1, the Keystone XL Pipeline Approval Act, sending the bill approving the pipeline to the president's desk.

February 24, 2015 – President Obama vetoes S.1, the Keystone XL Pipeline Approval Act.

Source: U.S. House of Representatives Energy & Commerce Committee

Chapter 2: Why Does Congress Have Difficulty Supporting The Department of Defense's Operational Energy Strategy?

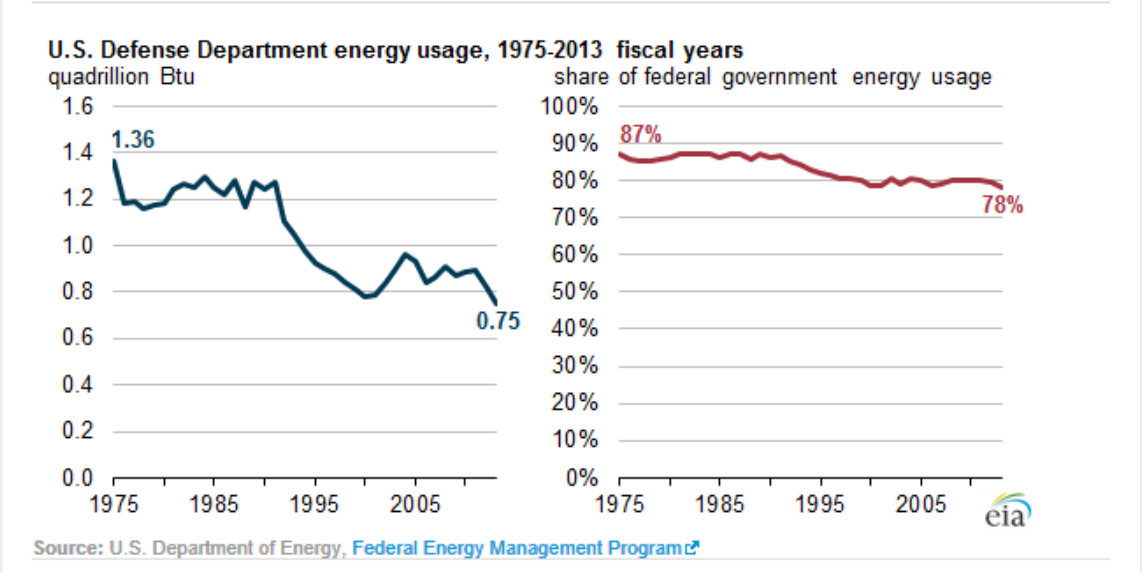
Introduction

Chapter 1 examined the effects of the Keystone XL Pipeline (KXL) on U.S. energy security. Chapter 1 set out to examine the effects of the KXL pipeline on U.S. energy security, but the analysis led to a surprising outcome – there is no clear definition of 'energy security' being used by the U.S. government to measure any benefit the KXL pipeline would have on U.S. energy security. The examination found that the two entities with oversight of the KXL pipeline, the U.S. Congress and U.S. Department of State, were using different language and concepts of what they believed 'energy security' meant. The chapter concluded that U.S. energy policy lacks cohesiveness and comprehensiveness, and without a conceptual framework allows special interests, such as the company behind the KXL, to claim energy-related projects increase the energy security of the U.S. The lack of such a definition or framework to guide energy policy also results in policy gridlock, as evidenced by the inability to approve or disapprove of the KXL pipeline after 5 years of debate.

In sharp contrast to both Congress and the State Department, the Department of Defense (DOD) has defined 'energy security' and has put forth an energy strategy to guide the Department of Defense in reducing its energy consumption. This is not a surprise, as the Department of Defense is the largest organizational user of petroleum in

the world.[86] The Department of Defense is also the largest user of energy in the federal government.

Figure 1. U.S. Department of Defense Energy Consumption



Source: Energy Information Agency

Despite defining 'energy security' as well as having a strategy to reduce the department's energy consumption, not all concerned are on board with DOD's energy strategy; more specifically, Congress. Congress' authority over budgeting assures that if Congress disagrees with a component of any DOD budget request, it will not get funded. In the case of DOD's energy strategy, Congress has specifically targeted the department's research and funding into biofuels for cuts.

[86] Moshe Schwartz et al., "Department of Defense Energy Initiatives: Background and Issues for Congress," *Congressional Research Service Report*, (Washington, DC: December 10, 2012): i.

In keeping with the theme of this thesis portfolio, Chapter 2 will explore why Congress has targeted DOD's biofuels program for cuts, when biofuels are a central component to DOD's Operational Energy Strategy. Congress' views on biofuels are significant, considering the potential they have to reduce U.S. consumption of petroleum. The answer to this question will help establish the validity of Chapter 2's hypothesis, which is that Congress' lack of a cohesive definition or concept of 'energy security' has led it into conflict with DOD, an organization that has defined and conceptualized the term 'energy security'. The lack of a clear definition or conceptualization of 'energy security' is a problem throughout the U.S. government, and as a result may be hindering the development and implementation of a cohesive energy policy to address U.S. energy security needs. Just as the failure to define and conceptualize 'energy security' allowed special interests to define U.S. energy policy, such as the KXL pipeline, a failure to define and conceptualize the term has allowed narrow political interests to define energy policy.

This chapter begins with a brief reintroduction of the term 'energy security', and a recap of how both Congress and DOD define 'energy security'. Second, a literature review is conducted on DOD's Operational Energy Strategy. This is necessary to assess how well DOD's definition of 'energy security' is aligned with the department's energy strategy. A discussion of how language can be problematic for government branches and agencies will also be included. Third, after the literature review, an analysis of why alternative fuels are important to DOD's energy strategy, as well as Congressional action and statements regarding alternative fuels will be examined, setting up the

aforementioned hypothesis to be tested. Lastly, a conclusion will be offered, summarizing Chapter 2's findings. This is offered as part of an effort to determine whether or not the lack of a comprehensive and cohesive definition of 'energy security' is affecting the ability of the U.S. to increase its energy security through effective energy policies.

Literature Review

Part I: Brief Reintroduction of Energy Security

In Chapter 1, the term 'energy security' is examined. Multiple meanings of the term were found, even within U.S. policy. Unsurprisingly, there is little agreement within the academic community of how 'energy security' should be defined, or if it should even be defined in the first place. When the term is defined, it is reflective of a nation's unique energy needs and resources. The U.S. has yet to define this term, despite the growing importance of energy, as reflected in the political rhetoric regarding U.S. energy independence and security as a result of the increase in U.S. energy production that has allowed the U.S. to become one of the world's leading producers of oil and gas. One hypothesis of this thesis portfolio posits that without a comprehensive and coherent definition of the term, U.S. energy policy will be ineffective at increasing U.S. energy security. Therefore, from a policy perspective, it is important to have a definition and concept of the term from which an effective policy can be drawn from.

Despite the lack of any coherent definition of the term from the highest levels of the U.S. government, including the Department of Energy, DOD has taken the initiative on the critical issue of energy security. As outlined in the QDR released in 2010, DOD defines 'energy security' as "having assured access to reliable supplies of energy and the ability to protect and deliver sufficient energy to meet operational needs."[87] As this chapter will demonstrate, an effective energy policy begins with a cohesive definition of the term, as DOD has done. In sharp contrast to DOD, the U.S. Congress has never defined or conceptualized the term, despite passing several pieces of legislation since the 1970s pertaining to U.S. energy independence and security.[88] It is hard to imagine legislation that has a coherent understanding of energy without first defining and conceptualizing the issue first. This chapter posits that as a result of differences in defining the term, narrow political interests have been allowed to define 'energy security' for the U.S. Congress, and policy gridlock has ensued as a result.

Part II: What is DOD's Operational Energy Strategy?

In 2010, the Department released the fourth QDR, and for the first time, identified energy security as critical to national security. For this reason, the QDR defined the term 'energy security'. Following the release of the QDR, in 2011 the Department released the inaugural Operational Energy Strategy, the first time the Department has attempted to transform the way the U.S. military thinks about and consumes energy. The Strategy document is intended to give the various U.S. military branches a common direction and

[87] U.S. Department of Defense, *Quadrennial Defense Review*, (Washington, DC: 2010): 87.
[88] Peter Z. Grossman, "The U.S. Energy Narrative, its Persistence, and its Impact on 40 Years of U.S. Energy Policy" (presentation, The Hobby Center for Public Policy, Houston, TX, October 16, 2013).

goal, while providing overarching guidance on reducing their energy demand and improving energy security. As a result, the Operational Energy Strategy carefully aligns with the goals outlined by the 2010 QDR.

The strategy document makes clear the reason the military now needs to think about its energy consumption. These reasons include rising military demand for energy, the vulnerability of fuel supplies to attack in conflicts, and the volatility of fuel prices due to rising competition globally for the same energy resources.[89] In order to reduce these risks and vulnerabilities, the strategy outlines three principal ways for the military to reduce its energy consumption and improve its energy security.

First, the strategy highlights the need to reduce energy demand in military operations. Of the three principals outlined in the document, this has been identified as DOD's top priority. A reduction in fuel demand has tactical, operational, and strategic benefits. U.S. military operations require and consume large amounts of fuel, and military supply lines for fuel are both vulnerable to attack and costly. Improved efficiency in military energy usage has the potential to reduce both risks and costs, and improve military missions whether they are humanitarian or combat in nature. To achieve the desired reduction for demand in military operations, the strategy recommends a two front approach: investing in new energy efficient technologies, and modifying existing practices and behaviors.[90]

[89] U.S. Department of Defense, *Operational Energy Strategy*, (Washington, DC: 2011): 1.

[90] Ibid. 6.

Second, the strategy calls for the Department to expand its energy supply options. The reliability of petroleum, DOD's main energy source, is increasingly at risk. Relying on a single energy source such as petroleum has serious economic, strategic, and environmental risks. These risk factors have been identified as the volatility of oil prices, the geopolitical effects of rising global demand for oil, the effects of first procuring and then transporting large supplies of fuel, and the damage caused to the environment. These factors can also empower nations hostile to the U.S., and increase price and political instability. The effort to diversify DOD's energy sources is second only behind the effort to reduce demand for energy.

The potential of alternative fuels has been identified by DOD as an important component to the future of the U.S. energy landscape.[91] In order to develop the potential of alternative fuels, the Strategy document calls for continued investment in the Research, Development, Testing, and Evaluation (RDT&E) of alternative fuels. The investment in alternative fuels must be supported by four criteria coving both economic and technical feasibility: alternative fuels must be "drop in" (compatible with current equipment), must be able to support a globally deployed force, consider the potential for upstream and downstream consequences (i.e. higher food prices), and the lifecycle of greenhouse gas emissions must be less than or equal to emissions from conventional fuel.[92] Additionally, the Department states that it will acquire alternative fuels at prices that are competitive with conventional fuels. This has proved to be a problem for the Department, and will be explored in this chapter at length.

[91] Ibid. 8.
[92] Ibid. 8.

Finally, the third principal the Strategy document articulates is more energy capability. Energy itself is an important capability, and going forward, should be an important consideration in U.S. force structure and strategy. Currently, the U.S. military is structured and equipped to use large amounts of energy, and oil in particular. The challenges of supplying fuel are currently not a strategic consideration taken into account. Integrating energy considerations will mean making tradeoffs in the equipping and deployment of forces in the future, which will in turn help DOD meet its strategic goals.

The importance of biofuels to the DOD energy strategy is so important that the individual services (Army, Navy, Air Force, Marine Corps) have included the increased use of biofuels in each of the individual services' energy visions. For instance, the Army and Marine Corps have both included "increased use of renewable/alternative energy" in their respective energy visions, while the Navy has made "Green the Footprint" (of the fleet) a priority.[93] Despite the differences of what the various services' call their goal of using increased biofuels, their goal is the same – understanding that energy security is critical to both economic and national security. Current reliance on fossil fuels represents a significant threat to not only the U.S. military, but also to the country as a whole.[94] The ability of the U.S. to diversify energy resources and move away from fossil fuels will be a critical component of future U.S. energy security.[95]

[93] Ibid. 12.
[94] Center for Naval Analysis, *Powering America's Defense: Energy and the Risks to National Security*, May 2009: *vii*.
[95] Ibid. *vii*.

Part III: How Language Causes Misunderstanding

A Government Accountability Office (GAO) report from 2010 studied the problem of Federal agencies using different definitions and vocabulary. What the GAO found was that using multiple definitions and different terminology creates confusion, and makes effective collaboration between Federal agencies more difficult.[96] The GAO report also found that in the absence of a consistent definition and means of measurement, a term might mean or designate several different conditions, compounding the problem of interagency collaboration and policy effectiveness.[97] In the report's conclusion, the GAO noted that interagency coordination was more likely to occur between agencies that used a common definition and vocabulary.[98] The report is illustrative of how the failure to conceptualize an issue can limit a policy's effectiveness, and stymie efforts at interagency cooperation and coordination to address the same policy issue. The same problem of conceptualization is currently affecting attempts at creating a coherent and cohesive U.S. energy policy, an issue that involves many government agencies, often with their own definitions or lack of a working definition, and vocabulary.

The importance of definitions and vocabulary in terms of 'energy' and 'energy security' is myriad. The discussion in Chapter 1 of what 'energy security' means offered many differing definitions, with each definition offering a different means of how to measure security in terms of energy. The GAO report supports the theory that in order to have an effective policy, it is first necessary to have a common definition of the issue,

[96] U.S. Government Accountability Office, *Homelessness: A Common Vocabulary Could Help Agencies Collaborate and Collect More Consistent Data*, GAO-10-702 (Washington, DC: 2010): What GAO Found.
[97] Ibid. 29.
[98] Ibid. 48.

and a common vocabulary used to measure and define the problem. Without a common definition and vocabulary, a policy's effectiveness will be affected, as will agency efforts at collaboration. In terms of 'energy security', this is most acute due to the lack of agreement among the many agencies that deal with energy and energy policy of what the term 'energy security' means. As previously noted, only DOD has defined the term 'energy security'.

The lack of a common definition and vocabulary for the term 'energy security' is not only limited to DOD and the U.S. Congress. The problem is so widespread that in January 2014, President Obama issued a Presidential Memorandum ordering the undertaking of an inaugural Quadrennial Energy Review (QER). The goal of the QER is to provide the U.S. with a "comprehensive and integrated energy strategy resulting from interagency dialogue and active engagement of external stakeholders."[99] The Presidential Memo acknowledges the Department of Energy's (DOE) broad role in the development of energy policy, while also acknowledging that there are several other Federal agencies and departments that also have a role in developing U.S. energy policy.

In addition to laying out the reasons for ordering an inaugural QER, the Presidential Memo also lists the Federal agencies and branches that are to be included in the QER. There are a total of twenty-two agencies and government branches listed to participate in the QER; most notably including DOD and the National Security Staff.[100] The inclusion of DOD and National Security Staff in the QER underscores the

[99] "Establishing a Quadrennial Energy Review," The White House, accessed April 15, 2014, http://www.whitehouse.gov/the-press-office/2014/01/09/presidential-memorandum-establishing-quadrennial-energy-review.
[100] Ibid.

importance that energy has in not only U.S. energy policy, but defense and national security policy as well. However, with twenty-two government agencies and branches partaking in the QER, the importance of coming to an agreement on a meaningful definition of 'energy security' and related vocabulary is only magnified. A lack of consensus on definitions and common vocabulary will only compound the problem of establishing a comprehensive and integrated energy strategy.

A recent Senate Armed Services Committee hearing during the 113th Congress highlights the lack of a common vocabulary and its potential to affect the discussion of DOD's Operational Energy Strategy. The Senate hearing, titled "Posture of the Department of the Navy," examined the Navy's Defense Authorization Request for fiscal year 2015. Included in the request was $170 million in funding for the Navy's research into alternative fuels, in support of DOD's Operational Energy Strategy. During the hearing, Senator Ted Cruz (R-TX) asked the Secretary of the Navy, The Honorable Raymond E. Mabus Jr., why the Navy was spending money studying algae fuel, when the Defense Department was cutting the number of Marine battalions. In response, Secretary Mabus noted that the funding was not for "algae fuel", but for "alternative fuels."[101]

The confusion over the term may seem minor, and may have been an attempt by the Senator to win political points motivated by narrow political interests. However, it is an example that highlights the stark contrast two institutions, DOD and Congress, have developed toward energy security. While DOD has developed definitions and vocabulary to conceptualize the issue, Congress has not, and the failure by Senator Cruz to

[101] U.S. Senate, Armed Services Committee Hearing, *Posture of the Department of the Navy*, March 27, 2014: 44.

distinguish what "alternative fuels" comprise confirms that Congress' inability to define 'energy security' and common vocabulary is limiting the ability to establish a more cohesive and integrated national energy policy. Statements and comments from Sen. Cruz during committee hearings undermine the seriousness and urgency of policy efforts to increase energy security not only for DOD, but also for the U.S. as a nation through a coherent and cohesive energy strategy aimed at reducing U.S. military reliance on fossil fuels.

The failure to conceptualize the issue of 'energy security' in Congress is not the result of a single politician. Single politicians, such as Sen. Cruz, merely represent the failure to conceptualize the issue at the political level. Both the Republican and Democratic platforms have failed to conceptualize and define the issue of 'energy security'. While the Republican National Committee (RNC) advocates for 'energy independence', the platform does not define or describe what U.S. energy independence is or how it is to be achieved.[102] Curiously, the platform for 'energy independence' advocated by the RNC does not include alternative fuels. This may help to explain the hostility to such alternative fuel programs, such as DOD's, by Republican lawmakers. The Democratic National Committee (DNC) also touts 'energy independence' as its goal for U.S. energy policy. However, much like the RNC, the DNC fails to define what 'energy independence' is and how energy independence will be achieved. The

[102] Republican National Committee, Our Party-Energy, http://www.gop.com/our-party/.

Democratic platform does, however, include alternative fuels such as biofuels in its platform.[103]

The competing party platforms for energy policy are more similar than dissimilar, in that each platform offered is vague on what 'energy independence' mean, and are not close to being meaningful or even marginally conceptualized policies. The similarity in ambiguity is not a coincidence. Grossman notes that the solution of 'energy independence' is politically popular because it could mean anything, take years to realize, and sounds decisive.[104] For these reasons, any political interest can influence Congress by claiming to represent policy that helps the U.S. achieve 'energy independence', or oppose legislation that would affect their political interests. In the case of DOD biofuels, the political interest opposing such legislation is the oil and gas lobby. This will be discussed further in the coming sections.

The affects of Congress' inability to conceptualize the issue of 'energy security' are being felt first and foremost by DOD, which is currently trying to establish a cohesive and integrated energy policy. Unless there is agreement in the future over definitions and common vocabulary, it is likely that such exchanges between politicians and civilian DOD leaders will continue to happen at Senate and House of Representatives hearings. Disputes over vocabulary may seem trivial, but have a large impact on policy. The current conflict over language and vocabulary between DOD and Congress is jeopardizing DOD's ability to achieve the reduction in energy consumption that DOD

[103] Democratic National Committee, Issues-Energy Independence, http://www.democrats.org/issues/energy_independence.
[104] Peter Z. Grossman, "The U.S. Energy Narrative, its Persistence, and its Impact on 40 Years of U.S. Energy Policy."

believes to be vital to U.S. national security, by failing to conceptualize the issue of 'energy security' and pass policies that are cohesive and continuous.

Part IV: Why Alternative Fuels Are Important to DOD's Energy Strategy

The link between DOD's definition of 'energy security' and the Operational Energy Strategy comes from the need to reduce DOD's dependence on oil. More specifically, DOD wants to reduce its consumption of oil that is unreliable and unpredictable in price. As defined in the 2010 QDR, key parts of the definition forming 'energy security' include having "assured access" and "reliable supplies."[105] When the price of oil fluctuates and increases in price due to market volatility, its supply to the U.S. military is neither assured nor reliable.

Oil is the world's ultimate, most important commodity. It is traded globally, and is susceptible to price increases due to instability in countries and regions that produce oil. This is often referred to as a "security premium." The security premium increases the price of oil by several dollars a barrel, often for several weeks. Over the past few years, instability in the Middle East as a result of the Arab revolutions, and the ongoing conflict in Syria, have seen a security premium increase the cost of oil. The world is very familiar with these fluctuations in the price of oil, because the same scenario plays out every time instability arises.

Despite the increase in the U.S. of domestic oil and gas, thanks in large part to the shale gas revolution, and the decreasing levels of oil the U.S. imports, energy is still a

[105] U.S. Department of Defense, *Quadrennial Defense Review*, (Washington, DC: 2010): 87.

security concern. The U.S. is not immune from the market volatility of oil, even if it consumed all of the oil it produced and imported no foreign oil. The global market sets the price of oil, and there is little the U.S. can do about it. Oil is not only a national security vulnerability, it is also a military vulnerability. As the world's single largest organizational consumer of oil, the U.S. military is especially sensitive to the price of oil.

The implications for DOD over the increase in the price of oil are tremendous. Every $1 increase in the price of oil per barrel results in an extra $30 million the U.S. Navy and Marine Corps must pay.[106] Like the Navy and Marine Corps, the Army and Air Force are also vulnerable to increases in the price of oil. Recent spikes in the price of fossil fuels have squeezed the Services' budgets, and have forced the Navy and Air Force to find funds to cover the shortfall.

Annually, DOD spends $15 billion on fossil fuels.[107] In the fiscal years of 2011 and 2012, market volatility in the price of oil added an additional $3 billion to the cost DOD had to pay for fuel. The fiscal year of 2013 was no different. Spikes in the price of oil left the Navy needing an additional $450 million to cover its fuel costs.[108] The Air Force, the branch that consumes the most fossil fuel of the services, faced an unexpected fuel bill of $700 million.[109]

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[106] Statement of The Honorable Ray Mabus, Secretary of the Navy, Before the Senate Armed Services Committee; March 27, 2014: 16.
[107] Ibid. 17.
[108] "Services' Budgets Squeezed By Oil Spikes," *Defense Daily*, April 19, 2013, http://www.defensedaily.com/services-budgets-squeezed-by-oil-spikes/.
[109] "Unexpected $700 Million Fuel Bill Sends Air Force On Hunt For Funds," *InsideDefense.com*, April 23, 2013.

The unexpected fuel bills that the services face every year are being compounded by DOD's shrinking budgets. The reduction in defense spending, known as "sequestration," started in 2013. The cuts, totaling $500 million over 10 years, are forcing the military into making difficult budget decisions affecting weapons programs, training, maintenance, and personnel. Budget shortfalls resulting from having to pay the "security premium" for fossil fuel is forcing the various branches of the military to find the necessary funds, often forcing the military to curtail existing operations or to submit a reprogramming request moving funds from one program to another. Combined with sequestration, the cost of fossil fuels are increasingly leaving the U.S. military with fewer resources to pay for other needs.

Because of new weapon platforms that are due to enter service in the coming years that consume more fuel than the platforms they replacing, including the F-35 fighter jet, the Littoral Combat Ship (LCS), and the new Air Force tanker, the KC-46A, DOD's fuel demand is expected to rise by at least 10 percent by 2020.[110] Against a backdrop of shrinking budgets and reprogramming to cover fuel costs, a military that uses more fuel is only increasing the vulnerability it faces from fluctuations in oil prices. This has led DOD to increase efforts at increasing its own energy security, which in turn increases the security of the U.S.

One way of increasing DOD's energy security is to diversify its fuel supply. Alternative fuels have the potential to reduce fuel costs, while also mitigating DOD's

[110] Sharon E. Burke, "Powering the Pentagon," *Foreign Affairs*, May/June 2014, http://www.foreignaffairs.com/articles/141207/sharon-e-burke/powering-the-pentagon.

exposure to volatile oil prices. To achieve this reduction in consumption of fossil fuels and increase DOD's energy security, each of the military services has set goals for alternative fuel use.

Not all of the military services are ambitious, or have shown initiative by taking the lead in developing alternative fuel programs as some services. This may be due to a lack of political support, which will be addressed in the next section. Of the three services, the Army has not set any specific target for using alternative fuels. The Army does, however, have the broad goal of increasing the use of alternative and renewable fuels.[111] The Air Force, on the other hand, is more ambitious than the Army in setting goals for alternative fuel use. This may be caused by the significant amounts of fuel the Air Force uses. To increase the use of alternative fuel, the Air Force has set a goal to "cost-competitively acquire 50% of the Air Force's domestic aviation fuel requirements via an alternative fuel blend."[112] The service that has shown the greatest ambition and initiative in alternative fuel development is the Navy. In 2009, Secretary Mabus introduced five energy goals for the Department of the Navy. The Secretary's five energy goals for the Navy included: [113]

- Increase alternative energy sources afloat. By 2020, the department of navy aims to obtain 50% of the fleet's liquid fuel from alternative sources.
- Increase alternative energy sources ashore. By 2020, the department of the navy aims to produce at least 50% ashore-based energy requirements from alternative sources and plans that 50% of don installations will be net-zero with regards to energy usage.

[111] Katherine Blakeley, "DOD Alternative Fuels: Policy, Initiatives and Legislative Activity," *Congressional Research Service Report*, (Washington, DC: December 14, 2012): 3.
[112] Ibid. 3.
[113] U.S. Department of the Navy, "Navy Energy and the Role of Biofuels Fact Sheet," http://greenfleet.dodlive.mil/files/2012/06/20120610-N45-Biofuel-FactSheet.pdf.

- Demonstrate a Green strike Group in local operations by 2012 and deploy a "Great Green fleet" in 2016.
- Reduce non-tactical commercial fleet petroleum use by 50% by 2015.
- Require energy efficient acquisition in which the evaluation of energy factors will be mandatory when awarding systems and building contracts.

The objective of setting such ambitious goals was first and foremost to increase the energy security of the Navy. The goals outlined by Secretary Mabus also sought to increase the strategic independence of the service, while also improving the Navy's warfighting capabilities.[114] These goals are also in line with DOD's definition of 'energy security.' Promoting domestic alternative fuels in the U.S. will free the U.S. military from the both the price volatility of oil that has cost DOD billions, and the potential lack of assured access to oil. Alternative fuels will allow the military to have "assured access" and a "reliable supply" of energy.

Reducing DOD's fuel consumption is more than saving money from high fuel bills. Alternative fuels also represent a way to mitigate the U.S. military's vulnerability to fossil fuel energy. In addition to the "security premium" vulnerability that DOD pays for during times instability in sensitive countries and regions, supply lines have been and still are attractive targets for any force opposing the U.S. military. Supply truck convoys carrying fuel are regularly targeted by Taliban in Afghanistan, which are often attacked and destroyed. Using less fossil fuel would reduce this vulnerability.

There is also a human cost to fossil fuel dependence. Protecting energy supplies is often a dangerous job, especially in Afghanistan. Protecting fuel convoys has been

[114] Statement of The Honorable Ray Mabus, 17.

described as one of the most dangerous jobs in Afghanistan, with 1 casualty from every 24 missions.[115] The use of alternative fuels will allow DOD to reduce risk and vulnerability by reducing reliance on fossil fuels that have a high cost, in both dollars and human lives. Making U.S. forces less vulnerable to risks from fossil fuels also makes them better warfighters, something that DOD continually improves upon.

In order to establish "assured access" and "reliable supplies" of alternative energy, under a 2011 presidential directive, the Department of the Navy joined with the Departments of Agriculture and Energy, to help promote a national biofuel industry.[116] A national biofuel industry would provide the U.S. military with assured access and a reliable supply of alternative energy. The goal of the initiative to start a domestic-based biofuels industry is to provide military-compatible biofuel at a price that is cost competitive with current fossil fuel prices. Despite the many potential benefits that DOD's Operational Energy Strategy offers to both national and military energy security, Congress has stymied the efforts aimed at increasing alternative fuels. More specifically, Republican opposition has stymied efforts of increasing DOD alternative fuel usage. This will be examined in the next section.

The DOD Operational Energy Strategy is the result of a careful analysis of the risks and vulnerabilities of U.S. military dependence on fossil fuels. A result of the analysis resulted in identifying energy as a key security issue, and prompted a policy

[115] Ehren Goosens, "Exploding Fuel Tankers Driving U.S. Army to Solar Power," *Bloomberg*, October 1, 2013, http://www.bloomberg.com/news/2013-09-30/exploding-fuel-tankers-driving-u-s-army-to-solar-power.html.

[116] "President Obama Announces Major Initiative to Spur Biofuels Industry," The White House, accessed April 21, 2014, http://www.whitehouse.gov/the-press-office/2011/08/16/president-obama-announces-major-initiative-spur-biofuels-industry-and-en.

response. Before policy decisions can be made, it is first necessary to define the issue. The Pentagon completed this task in the 2010 QDR, wherein it identified the issue of 'energy security' and offered a definition of the term. Defining the term has given the Pentagon an understanding of the risks and vulnerabilities associated with the issue of energy security, and have allowed it to propose and pursue a coherent and integrated policy solution aimed at increasing not only military energy security, but by reducing U.S. military consumption of fossil fuel, it would also increase the energy security of the U.S. as a nation.

Part V: Why Congress Fails to Support DOD's Energy Strategy

The U.S. Congress, as it has been previously noted, has not defined the term 'energy security.' Not having a working definition of the term would seem to make crafting a cohesive and integrated policy aimed at increasing national energy security difficult. Lacking a definition of the term hints of a wider problem – not having analyzed the risks and vulnerabilities of fossil fuel dependence, and how best to mitigate those vulnerabilities through a cohesive policy response. Underscoring the lack of a definition on the part of Congress are the partisan divisions that run through a divided Congress, with policy decisions often decided by political ideology and prejudices.

The DOD and Navy's attempt to use alternative fuels has become a political flashpoint in a larger, political battle: the use of government funds to finance new energy technology. Yet because Congress has not defined the term 'energy security,' there is no agreement or consensus in Congress over what a comprehensive and integrated policy

addressing the issue of energy security should look like. The result is a policy that is tenuous at best, and unpredictable at worst. The failure to conceptualize the issue of 'energy security' leaves policies aimed at increasing U.S. energy security, such as DOD's push for alternative fuels, in limbo and in jeopardy of not being funded every Congress based on the political fortunes of politicians.

The recent rise domestic oil and gas production in the U.S. is also weakening the call for a domestic-based biofuel industry supported by the Pentagon. As domestic production rises, decreasing U.S. reliance on imported foreign oil, U.S. oil and gas lobbies are increasing their efforts to undermine the effort to establish a biofuel industry as an alternative to petroleum fuel.[117] Despite the rise in domestic oil and gas output, the oil and gas produced in the U.S. is still part of the global market for oil and gas. This means that even oil and gas produced in the U.S. is subject to the price volatility of oil, and to the "security premium" when it occurs.

Many of the Members of Congress that are opposed to the Navy's biofuel program are often opposed due to political interests and considerations. While a majority of the lawmakers that oppose the Navy's biofuel program are Republican, Democrats have also crossed the divide to oppose the alternative fuel effort by DOD and the Navy. These lawmakers take campaign contributions from the oil and gas industry, or represent a part of the country that is heavily dependent on coal.[118] Despite the DNC's inclusion of

[117] Sandra I. Erwin, "Navy to Stay the Course With Biofuels," *National Defense Magazine*, January 20, 2014, http://www.nationaldefensemagazine.org/blog/Lists/Posts/Post.aspx?ID=1386.
[118] Diane Cardwell, "Military Spending on Biofuels Draws Fire," *The New York Times*, August 27, 2012, http://www.nytimes.com/2012/08/28/business/military-spending-on-biofuels-draws-fire.html?pagewanted=all&_r=0.

alternative fuels in its energy issue brief, the Senate version of the NDAA during the 112th Congress, S. 3254, had two restrictive amendments, S. Amdts. 314 and 2823, added during the Senate Armed Services Committee markup. The amendments would have restricted DOD's ability to purchase alternative fuels or invest biofuel production.[119] The prohibitive amendments passed a Senate Armed Services Committee controlled by the Democrats, a party that has included biofuels in its energy plan for the U.S.

Representative Mike Conway (R-TX) epitomizes the political divide that prevents Congress from coming to an agreement over efforts aimed at increasing U.S. energy security, via the Navy's biofuel program. According to OpenSecrets.org, Representative Conway receives a large proportion of his campaign contributions from oil and gas interests.[120] It should not be surprising then that Representative Conway alone proposed energy-related legislation opposing the Navy's biofuel program in the markup process of the National Defense Authorization Act (NDAA) for FY 2013 during the 112th Congress. The legislation proposed and passed, H.R. 4310, contained provisions similar to the Senate amendments that were added in committee markup, aimed at limiting DOD's ability to both purchase and invest in alternative fuels that are more expensive than petroleum fuels, and would have all but ended the DOD's pursuit of alternative fuels if passed by Congress.[121] The legislation advanced from both the Republican-controlled House Armed Services Committee and U.S. House of Representatives.

[119] DOD Alternative Fuels: Policy, Initiatives and Legislative Activity, p. 9.
[120] Ibid.
[121] DOD Alternative Fuels: Policy, Initiatives and Legislative Activity, p. 9.

With each party controlling a legislative chamber on the Hill, and each party having a different policy agenda for energy policy, getting a majority to come to a consensus on policy will be difficult for the DOD and Navy in future efforts. Midterm elections may swing the debate on the Navy's biofuel program, if either party is able to wrest control of the other chamber from the other party. Similarly, the presidential election in 2016 has the potential to bring in a new Republican administration, likely ending Federal funding for biofuel initiatives that the Obama Administration has been willing to fund. The fight over funding for the Navy's biofuel initiatives is now almost cyclical, with the NDAA coming to the committees for authorization each year. And with each attempt to get funding, there are disputes over exactly how far the government should go in investing in industry.

This thesis believes, however, that if Congress conceptualized the issue of 'energy security' and defined the term and vocabulary, the debate surrounding the Navy's biofuel initiatives would be different than the debate currently surrounding DOD's efforts at diversifying its energy sources. A look again at Senator Ted Cruz's questioning of Secretary Mabus highlights the lack of understanding of the issues surrounding energy security, and efforts aimed at increasing U.S. energy security. Senator Cruz, in questioning Secretary Mabus, refers to the potential loss of two Marine battalions as the priority for the Navy to keep, not "research algae fuel."[122] What the Senator fails to understand is that the potential loss of Marine battalions is directly correlated to shrinking defense budgets, and the billions of dollars DOD has to pay each year for fuel than was

[122] U.S. Senate, Armed Services Committee Hearing, p. 44.

not originally budgeted for. Secretary Mabus was correct when replying to the Senator that, if DOD does not get some competition to compete with the price DOD pays for fossil fuels, then there will be "fewer soldiers, fewer sailors, fewer platforms."[123]

A related incident at a Congressional hearing in the 112th Congress further underscores the lack of conceptualization Congress has on the issue of 'energy security'. During a House Armed Services Committee hearing in February 2012, Representative Randy Forbes (R-VA) reminded Secretary Mabus that he was "not the secretary of energy."[124] The large amounts of energy consumed by DOD, and the Navy in particular, would make Secretary Mabus a reliable witness to the need of the U.S. military to reduce its reliance on petroleum fuels. The acerbic remark by Rep. Forbes reinforces the belief that Congress does not truly have an understanding of the vulnerability of U.S. national security posed by dependence on petroleum fuels, given the large amount of petroleum fuel consumed by DOD, the largest organizational user of petroleum in the world.

A similar argument can be made against the claim that the government should not invest in industry. Energy is not the first industry the U.S. military will collaborate and work with. There is a long and successful history of collaboration between the U.S. military and industry, including some of the world's most important and critical technology, such as semiconductors and the Internet.[125] As another Republican Member of Congress, Representative Randy Forbes (R-VA) reminded Secretary Mabus, "You're

[123] Ibid.
[124] Military Spending on Biofuels Draws Fire.
[125] Powering the Pentagon.

not the secretary of energy, you're the secretary of the Navy."[126] Yet again, a Member of Congress fails to understand the wider implications of collaboration between the military and industry on energy. Namely, that the benefits of DOD's efforts to increase its own energy security will have benefits for the wider U.S. energy sector as well.[127] This may be contributed to the lack of a Congressional definition for 'energy security,' including an understanding of the risks and vulnerabilities that come with the issue of energy security.

Sharon E. Burke, Assistant Secretary of Defense for Operational Energy Plans and Programs, once remarked that "our primary rationale is not economic, our job is to defend the country."[128] While the Pentagon will always be vulnerable to charges of wasteful spending, it should be noted that Congress supports wasteful weapons programs because they are politically beneficial, and are often associated with jobs and economic gains in a Member's home district. What legislators fail to understand is that the potential benefits of alternative fuels, including biofuel, far outweigh concerns over wasteful spending or concerns over the government interfering in the free market. The energy industry is no different from other defense programs, and has the ability to become an economic driver in the U.S. by creating jobs and supporting other industries that would contribute to a biofuel industry, such as agriculture.

There exists a profound misunderstanding of energy security in Congress, and that the high cost of fossil fuel is not limited to just dollars. There is a human cost associated with fuel, and this has not been emphasized enough. DOD's understanding of the issue

[126] Military Spending on Biofuels Draws Fire.
[127] Powering the Pentagon.
[128] Ibid.

of energy security and its profound implications for U.S. national security may be contributed to its ability to define the term, and assess its risks and vulnerabilities from its definition. Similarly, a lack of a definition of the term has hindered Congressional ability to see the threat that dependence on fossil fuels has not only on U.S. military security, but also to a greater extent, U.S. national security.

Conclusion

This chapter has attempted to look at the lack of a definition and concept for 'energy security' in Congress, and its implications for U.S. energy policy. The premise at the beginning of the chapter inferred that because Congress lacked a definition and conceptualization of 'energy security,' and thus an understanding of the risks and vulnerabilities of energy security issues, an attempt by DOD to pursue its own policies to address DOD related energy security issues would result in not only policy deadlock, but policy driven by political interests to the detriment of sound energy policy. The resulting examination found this to be true. While current DOD biofuel policy is slowly moving forward, it is fragile. A change in administrations in the 2016 election, or if a single party is able to control both chambers of Congress, DOD's progress in establishing assured and reliable supplies of energy through an Operational Energy Strategy may be completely reversed.

The conflict over policy can be seen at every Senate and House committee hearing regarding the Department of the Navy's attempts to increase U.S. military energy

security. While Congress has largely supported other elements of DOD's Operational Energy Strategy, Congress continues to oppose alternative fuels, including biofuels. The success of DOD's energy strategy lies largely on its ability to reduce its consumption of fossil fuels and diversify its energy supply. Continued dependence on fossil fuels will continue to inhibit DOD's future ability to make decisions affecting the future of the force, when a large part of a shrinking DOD budget is consumed by fuel costs. This conflict is unnecessary and could be avoided had Congress established and conceptualized the term 'energy security.' A large part of this conflict over policy can be attributed to a Congress that has allowed political interests, in the absence of any concept of how to measure or increase 'energy security', to oppose any alternative industry or policy to fossil fuels. A legislative conceptualization of the term would be a good place to start, something that has never been done in 40 years of trying. Policy conflicts over diversifying the nation's energy sources will continue, so long as Congress and DOD continue to use differing concepts. Or, in the case of Congress, no concept at all. After all, energy independence is a known winner.

Chapter 3: What Affect Does the U.S. Department of Energy Have on U.S. Energy Policy?

Introduction

The central theme of this thesis has concerned itself with how the United States is addressing the issue of energy security, through the prism of energy policy. The previous two chapters examined the effects of not having a single coherent definition, or conceptualization, of 'energy security' on U.S. energy policy concerning infrastructure (the KXL pipeline), and alternative fuels (DOD energy strategy). The research demonstrated that in each case, without a definition or concept of the issue from the Federal government, special interests, in the case of the KXL pipeline, or narrow political interests, in the case of DOD energy strategy, have been allowed to fill the conceptual and definitional void, and formulate or oppose potential energy policies to their benefit, at the expense of U.S. security. The thesis thus far has not examined the one cabinet-level agency with "energy" in its name – the U.S. Department of Energy (DOE). An examination of U.S. energy security would not be complete without an analysis involving the U.S. DOE, and the role the department plays in developing energy security policy in the United States.

This final chapter will seek to explore how the U.S. DOE develops and implements U.S. energy policy, and the role of the department in developing U.S. energy security strategy. This chapter's hypothesis states that the DOE, as the nation's cabinet-level department with "energy" in its name, should be at the forefront of developing a

cohesive and integrated national energy policy, as well as defining and conceptualizing the term 'energy security.' In other words, how much influence does the U.S. DOE have on developing a national energy policy?

Firstly, in order to fully understand DOE's role in policy development, the analysis will examine DOE's statutory responsibility, from which all Federal agencies derive their authority to make policy from. Secondly, an analysis will also examine the policy decisions other Federal agencies are taking that influence national energy policy today, including the Environmental Protection Agency (EPA) and the Department of the Interior (DOI). These departments have made significant decisions regarding energy policy in recent years, which reflect their ability to decide and influence policy independently of the DOE. This will help determine the ability of DOE to lead and develop not only national energy policy, but also a definition and concept of 'energy security' for the U.S. to follow. An examination will also be made of the structural authority that oversees energy policy in the U.S., and whether the right structure is in place to have a coordinated national energy policy. Finally, upon completion of the analysis of the DOE, a conclusion will be offered which summarizes this chapter's findings.

National Energy Policies, Past and Present

Before the 1970s, the Federal government had a limited role in the development and formulation U.S. national energy policy. Before 1977, the U.S. did not have a cabinet-level department dedicated to the issue of energy. Instead, the U.S. relied on and expected private industry to produce and distribute the energy needed.[129] U.S. energy policy formulation before 1977 could be described as "an ad hoc process."[130] No overall policy for energy existed, as U.S. officials thought in terms of "particular fuels, technologies, and resources" rather than "energy."[131]

Two factors brought about the need for a cabinet-level department for energy however. The first was the Federal government's role in developing and commercializing nuclear energy; the second was the energy crisis of the mid-1970s.[132] The Department of Energy Organization Act (Public Law 95-91), passed on August 4, 1977 established the Department of Energy (DOE) and consolidated government energy functions into the newly created department. The goal of the newly created department was to "establish and observe policies consistent with a coordinated energy policy" and to "provide for a mechanism through which a coordinated national energy policy can be formulated and implemented to deal with the short-, mid- and long-term energy problems

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[129] "A Brief History of the Department of Energy," U.S. Department of Energy, accessed January 18, 2015, http://energy.gov/management/office-management/operational-management/history/brief-history-department-energy.
[130] U.S. General Accounting Office, *Formulation of U.S. Energy Policy*, ID-80-21 (Washington, DC: September 30, 1980): Abstract.
[131] "A Brief History of the Department of Energy," U.S. Department of Energy.
[132] Ibid.

of the Nation."[133] With a Congressional mandate, it would be assumed that the U.S. would have a more integrated, cohesive, and coherent energy strategy.

However, despite the DOE having the mandate and mission to coordinate a consistent U.S. energy policy, there has been a long list of legislation attempting to solve the problem of "energy independence" and "energy security." While this chapter and thesis will focus on more recent attempts at U.S. energy security policy, a sample of legislation as witness to these attempts include:

The Energy Independence Act of 1975; Energy Independence Authority 1976; Enabling act of the DOE 1977; National Energy Act 1978; Various acts (e.g. SFC, MFEE) 1980; Energy Independence Act of 1989; American Energy Independence Act of 1991; National Energy Security Act of 1992; Energy Independence, Infrastructure, and Investment Act of 1993; Domestic Oil and Gas Crisis Tax Relief and Foreign Oil Reliance Reversal Act of 1999; Energy Independence for America Act of 2000; Energy Independence Act of 2001; Biofuels Energy Independence Act of 2001; Putting the Pedal to the Metal: Accelerating the Energy Independence of America Act; New Manhattan Project for Energy Independence; Energy Independence and Security Act of 2007; and the Energy Independence Now Act of 2009.[134]

Despite the plethora of attempts at passing legislation aimed at increasing U.S. energy security, U.S. energy policy still lacked cohesion and coordination. This may be

[133] Department of Energy Organization Act of 1977; Accessed January 20, 2015, http://www.gpo.gov/fdsys/pkg/STATUTE-91/pdf/STATUTE-91-Pg565.pdf.
[134] Peter Z. Grossman, "The U.S. Energy Narrative, its Persistence, and its Impact on 40 Years of U.S. Energy Policy."

accounted for by the lack of any conceptualization of what "energy security" is and what it means to the U.S. Such a lack of conceptualization has led to Federal energy policy to continue to be disjointed and piecemeal. Another contributing factor to this may be the lack of authority for DOE to coordinate energy policy at the Federal level, despite the DOE being created at the cabinet-level for exactly this purpose. The assessment that U.S. energy policy is also observed by the International Energy Agency (IEA) in a report released in December 2014, which has acknowledged that the lack of an overarching policy hamstrings U.S. potential.[135]

More recent attempts at developing a national energy policy are illustrative of this point. In May of 2001, a report from the National Energy Policy Development Group (NEPDG), entitled "National Energy Policy," was released. The NEPDG was created on January 29, 2001 by the new Bush administration to develop a national energy policy. The group was comprised of cabinet-level officials and other senior federal level officials, and chaired by the Vice President. The directive President Bush gave the NEPDG was to "develop a national energy policy designed to help the private sector, and, as necessary and appropriate, State and local governments promote dependable, affordable, and environmentally sound production and distribution of energy for the future."[136]

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[135] Jared Gilmour, "US Energy Policy Review Reveals US Doesn't Have an Energy Policy," *The Christian Science Monitor,* December 20, 2014, http://www.csmonitor.com/Environment/Energy-Voices/2014/1220/US-energy-policy-review-reveals-US-doesn-t-have-an-energy-policy.

[136] *National Energy Policy: Report of the National Energy Policy Development Group*. U.S. Government Printing Office (Washington, D.C.: May 2001): viii.

The National Energy Policy report produced by the NEPDG mentioned the term "energy security" 40 times, while not once offering a definition or conceptualization of the term to base its usage on. The report also contained over 100 recommendations for new legislative proposals and executive actions. Yet not one of the over 100 recommendations was to give more statutory authority, or to transfer the energy related responsibilities of other cabinet-level departments to the DOE to better coordinate and formulate an overall U.S. energy policy. To the contrary, it became obvious from the report's recommendations that several cabinet-level departments play a role in the formulation of U.S. energy policy. This may also be an impediment to the ability of the U.S. to form a national energy policy today.

These departments include the Department of the Interior, Department of the Treasury, Department of Transportation, Department of Commerce, Department of State, and the Environmental Protection Agency. With so many departments involved in formulating energy policy, it is possible to see why a there is a lack of consensus in conceptualizing energy as a security issue. It is also possible to see how it is difficult for a single department, the DOE, to formulate and coordinate a consistent policy with cohesion between different agencies with well-defined measurable objectives.

Structural Authority

It has been noted that political structure can make it difficult to develop a cohesive and coordinated national policy, in which many different centers of power must

reach consensus.[137] A case study of energy policy in the U.S. illustrates this point. During a conversation with the Council on Foreign Relations, Secretary Moniz revealed that one difficulty in energy policy is the decision-making process, which is fragmented across different agencies in the federal government and committees in Congress.[138] A major need recognized by the energy secretary was to get a process in place to bring together the different agencies, and bring a coherence across all federal agencies and policy, which may also have the potential to bring coherence to Congress and the fragmented committee structure that oversees U.S. energy policy. The fragmentation in U.S. energy policy is illustrated in the two charts below. Given the plethora of agencies with a role in the development of energy policy, it is easy to see how it is difficult for the DOE to conceptualize and define 'energy security', while also coordinating a cohesive national energy policy.

[137] Donald Elliott "Why the United States Does Not Have a Renewable Energy Policy," Environmental Law Institute, 2013.
[138] Council on Foreign Relations "Energy Secretary Ernest Moniz on U.S. Energy Policy," October 6, 2014, http://www.cfr.org/energy-policy/energy-secretary-ernest-moniz-us-energy-policy/p35752.

Figure 2. Executive Agencies With A Role in Energy Policy

Executive Branch Agencies with a Role in Federal Energy Policy

A *partial* list of the executive-branch agencies or departments that have responsibility over some facet of energy-relevant policies or programs includes the following:[2]

- Department of Agriculture: R&D, demonstration, fuels-related agricultural policy.
- Department of Energy: energy policy, R&D, demonstration, loan guarantee and grant programs, efficiency standards for equipment and appliances, Power Marketing Administrations.
- Department of Commerce: trade and competiveness policy, oceans and marine policy.
- Department of Defense: technology R&D, demonstration, clean energy initiatives, international relations, security of energy transportation routes.
- Department of the Interior: management and conservation of most federal land and natural resources, including oil and natural gas development.
- Department of the Treasury: tax policy, international currency and banking.
- Department of Transportation: vehicle fuel economy standards and transportation infrastructure.
- Department of State: international relations and diplomacy, treaties, trade and foreign policy, development aid.
- Environmental Protection Agency: regulation of air, water, waste, and chemicals.
- Office of Management and Budget: helps president prepare the budget; measures the effectiveness of agency programs, policies, and procedures to see if they comply with White House policies.

Other federal entities with energy roles include: Federal Energy Regulatory Commission, Commodities Future Trading Corporation, Nuclear Regulatory Commission, Securities and Exchange Commission, and Housing and Urban Development.

Source: Bipartisan Policy Center

Figure 3. Congressional Committees With Energy Jurisdiction

Congressional Committees with Energy Jurisdiction	
HOUSE	**SENATE**
Agriculture	Agriculture, Nutrition, and Forestry
Appropriations	Appropriations
Armed Services	Armed Services
Budget	Banking, Housing and Urban Affairs
Energy and Commerce	Budget
Financial Services	Commerce, Science and Transportation
Foreign Affairs	Energy and Natural Resources
Homeland Security	Environment and Public Works
Judiciary	Finance
Natural Resources	Foreign Relations
Oversight and Government Reform	Health, Education, Labor and Pensions
Science, Space and Technology	Homeland Security and Government Affairs
Small Business	Indian Affairs (Special Committee)
Transportation and Infrastructure	Judiciary
Veterans' Affairs	Small Business and Entrepreneurship
Ways and Means	Veterans' Affairs

Source: Bipartisan Policy Center

Related to the fragmented authority problem of national policy making is the problem of divided government, with different political parties in control of different centers of authority.[139] The role that divided government plays in developing national policy, and in this case energy policy, is profound. Divided government is particularly important for policy consensus given the likelihood that one of the two major political parties is opposed to the other in regards to the role the government should play in energy.

As stated at the beginning of this chapter, energy policy has generally been left to market forces. However, if the DOE, or any government agency, is going to define and conceptualize 'energy security,' it will entail greater top-down decision-making, which will generate unease among Republicans, whom are largely skeptical not only about top-down decision making, but also the idea that political authorities are better able to determine what the market desires. This idea can be seen in Chapter 2 of this thesis, where DOD biofuel policy was examined. The strongest pushback the DOD received regarding the plan to lessen the military's overwhelming dependence on fossil fuels, and thus the nation's dependence, were from Republican Senators and Congressmen.

Finally, a third issue related to the fragmented and divided government that impedes national energy policy development is the constant change or shift in policies that result in the frequent changes in control of government by the two major political parties.[140] This can be best illustrated by the plethora of energy security related acts and

[139] Donald Elliott "Why the United States Does Not Have a Renewable Energy Policy."
[140] Ibid.

legislation that was listed at the beginning of this chapter. U.S. energy policy is afflicted by the lack of sustained policies, in which there is a lack of a long-term commitment to any one-policy initiative. As noted earlier, each piece of legislation reflected the priorities of that administration, or the interests and priorities of Congressional committees. Shifting priorities in energy policy are evident in each administration's attempt to have a national energy policy, from Nixon to Ford, from Carter to Reagan, from H.W. Bush to Clinton, and from W. Bush to Obama. This may help explain why U.S. energy policy has lacked consistent coordination and cohesion.

The idea of shifting policies and changing priorities can be seen again from the discussion in Chapter 2. The current administration has emphasized and supported the DOD energy strategy, however; with a new administration in 2017, this policy may either shift or change. The ability of policies to come and go only hampers the ability to conceptualize and have a long-term vision for what 'energy security' is to the U.S.

Despite the fragmentation of authority over energy policy decision-making, administrations have attempted to use interagency processes in order to attempt coherent energy policy. Shortly after coming to office in 2001, President George W. Bush ordered the National Energy Policy Development Group to develop a comprehensive national energy policy. The group was comprised of several Cabinet members, including the Department of State, Department of the Treasury, Department of the Interior, Department of Commerce, Department of Energy, and the Environmental Protection Agency.

While the term 'energy security' was mentioned over 30 times in the report to develop a national energy policy, not once was a concept or definition of what the term 'energy security' meant was put forth by the group. The group recommended 105 specific proposals to increase U.S. energy security. Despite linking energy security with U.S. trade and foreign policy, the group failed to conceptualize the issue of energy security, even though they had mapped out the strategic importance of energy from our domestic concerns to our foreign policy concerns. Not included among the 105 proposals was a concept or strategic vision of long-term U.S. energy security, only piecemeal recommendations.

As previously discussed in Chapter 2 of this thesis, the administration of Barack Obama is attempting the same interagency process to attempt a coherent energy policy, this time the Quadrennial Energy Review, as a work-around for the lack of a lead agency and singular concept of 'energy security.' The goal of the QER is to provide the U.S. with a comprehensive and integrated energy strategy resulting from interagency dialogue and active engagement of external stakeholders. Unlike the National Energy Policy Development Group of the George W. Bush administration, the QER has defined energy security as needing

> "to be more broadly defined to cover not only oil, but other sources of supply, and to be based not only on the ability to withstand shocks, but also to be able to recover quickly from any shocks that do occur. In addition, security is not exclusively domestic; it is dependent on interactions in the interconnected global energy market. U.S. energy security and the infrastructure that supports it should be viewed in the context of this new, broader, more collective definition of energy security"[141]

[141] Quadrennial Energy Review, S-17. April 2015.

Even with this definition of 'energy security' in the report, it remains to be seen if the review group will be able to develop a cohesive national energy policy that embodies the concept of 'energy security' that has been defined by the group. This is only a first step in a long overdue process. As the first QER is focused solely on energy transmission, storage, and distribution infrastructure, it remains to be seen if the next QER can build on the concept of 'energy security' envisioned in the inaugural edition of the QER. What remains to be seen is if this new interagency mechanism will be an effective tool in place of a single, lead agency in energy security policy development.

Department of Energy

The mission statement from DOE's website gives the impression that the department plays a role in developing and conceptualizing energy security for the nation, that is, "to ensure America's security and prosperity by addressing its energy, environmental and nuclear challenges through transformative science and technology solutions."[142] The mission statement implies that the DOE is involved with developing energy policy, and specifically energy security related policy, as the statement clearly references addressing the nation's energy challenges. It is no surprise then that the Secretary of Energy, Dr. Ernest Moniz, has mentioned the issue of U.S. energy security during policy speeches.

[142] "Mission of the Energy Department," U.S. Department of Energy, accessed September 15, 2014, http://www.energy.gov/mission.

During a policy speech in October 2013 at the Center for Strategic and International Studies in Washington, D.C., Secretary Moniz outlined 4 challenges to U.S. energy security:[143]

- US vulnerability to oil price volatility.
- Climate change and associated natural disasters and humanitarian crisis's that can result from climate change.
- Nuclear energy and the link between power generation and weaponized applications.
- Vulnerability of infrastructure.

Despite outlining challenges to U.S. energy security, Secretary Moniz failed to outline a definition or concept of what, exactly, energy security is to the U.S. Despite outlining the challenges to U.S. energy security, Secretary Moniz failed to address how the DOE would conceptualize the challenges he listed above into a coherent policy response. This raises the questions of what role the DOE performs in policy to address such challenges, and how much statutory authority the DOE has to develop and implement such a policy. In order to determine DOE's ability to address such policy questions, an examination of the agency's budget is necessary to determine the agency's priorities, and therefore policy objectives.

An analysis of DOE's budget reflects the agency's main priority: maintaining the U.S. nuclear weapons stockpile and fissile material used to make nuclear weapons.[144]

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[143] Jared Anderson, "Energy Secretary Moniz Discusses US Energy Security Challenges," *Breaking Energy*, October 24, 2013, http://breakingenergy.com/2013/10/24/energy-secretary-moniz-discusses-us-energy-security-challenges/.

[144] Nick Cunningham, "It's Not DOE That Drives Energy Policy," *Breaking Energy*, January 23, 2013, http://breakingenergy.com/2013/01/23/it-s-not-doe-that-drives-energy-policy/.

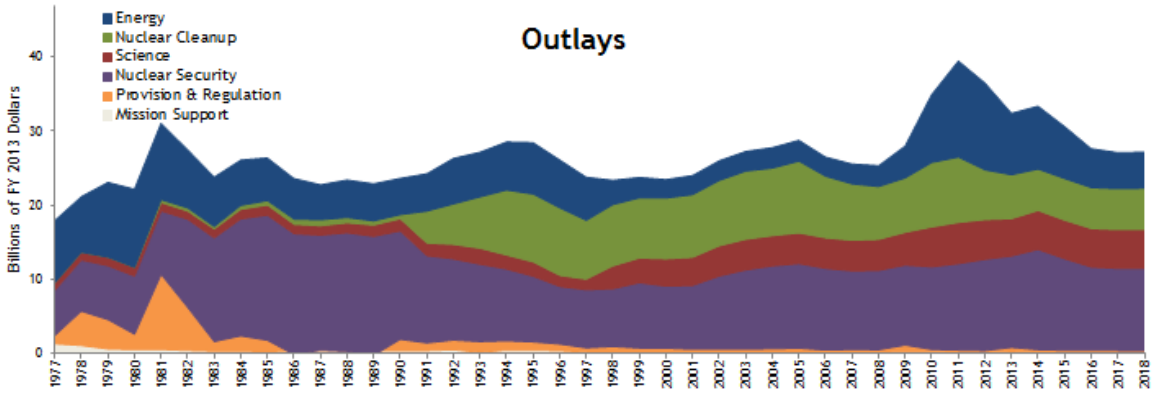
During fiscal year 2011, roughly two-thirds of DOE's budget, 63 percent, went to Atomic Energy Defense Activities, a formal line item on the department's U.S. government budget.[145] While the DOE plays a large role in the federal government's R&D programs and related science programs, the majority of the department's budget is directed to activities that may prevent it from focusing on energy security. The FY 2016 (fiscal year) budget request from the DOE continues to reflect this lack of budgetary focus. Secretary Moniz has stated that the FY 2016 budget request reflected the government's energy strategy and the department's commitment to promoting the President's energy strategy.[146]

Despite the Energy Secretary's statement that the DOE budget reflected energy strategy, the numbers in the budget did not reflect strategy. Weapons activities accounted for $8.8 billion in the FY 2016, request, far more than any other program dedicated to R&D or energy strategy. This also represented an increase of 10.2% over the previous FY 2015 request.[147] It is hard to imagine the DOE playing a large role in national energy policy development, when such a large proportion of its budget is not devoted to energy policy. Throughout the DOE's history, much of its budget has been allocated to nuclear activities, while DOE's non-nuclear budget has remained near constant during its 38 year

[145] Russell Rumbaugh and Nathan Cohn, "Resolving the Ambiguity of Nuclear Weapons Costs," Arms Control Association, https://www.armscontrol.org/act/2012_06/Resolving_the_Ambiguity_of_Nuclear_Weapons_Costs.
[146] Anna Forrester "Ernest Moniz: FY 2016 DOE Budget Request Reflects Gov't Energy Strategy," *ExecutiveGov,* February 4, 2015, http://www.executivegov.com/2015/02/ernest-moniz-fy-2016-doe-budget-request-reflects-govt-energy-strategy/#sthash.5JUOZMS3.dpuf.
147 Department of Energy, "FY 2016 Budget Summary," http://energy.gov/sites/prod/files/2015/01/f19/FY2016BudgetSummaryTableByAppropriation_0.pdf.

history, and has not seen any significant increase in funding related to policy development.

Figure 4. DOE Budget History



Source: U.S. Department of Energy

Role of Other Federal Agencies Driving Energy Policy

Despite its namesake, there are other federal agencies that are currently playing a larger role than DOE in driving the nation's energy policy. This section will briefly examine the EPA and DOI, which are both playing large parts in shaping the future of U.S. energy policy, something that the DOE should be doing, yet does not have the policy or regulatory authority to do.

In June 2014, the EPA proposed the Clean Power Plan, a new set of federal regulations that would reduce greenhouse gas emissions in the electricity sector.[148] The new rules were introduced as a result of the current administration's attempt to mitigate climate change. The new EPA rules are part of a pledge the current administration has made to cut U.S. greenhouse emissions by up to 28 percent over the next decade. The new rules would set carbon dioxide targets for states, requiring them to trim emissions. More specifically, the first-ever rules would target emissions from new coal-fired power plants.[149] However, the EPA has also proposed new rules for makers of heavy-duty trucks, requiring an increase in fuel efficiency by up to 24 percent. The EPA has also taken the first steps towards regulating greenhouse gas emissions from airplanes. Unlike the current proposed rules, which are expected to be finalized in the coming months, rules regulating emissions from airlines are expected to take years to write and finalize.[150]

The new EPA rules represent a significant policy choice, and one in which there seemed to be little or no consultation with DOE about the nation's mix of energy use. The new rules give the EPA significant sway over the direction of industry, and may accelerate the decrease in the use of fossil fuels as an energy source, which would represent a significant policy decision. While the new rules were proposed as part of the administration's plan to combat climate change, it is hard to see the role that the DOE played in determining the long-term plan for America's future energy usage. As the agency charged with developing energy policy, the first-ever EPA rules targeting

[148] Environmental Protection Agency "Clean Power Plan," http://www2.epa.gov/cleanpowerplan.
[149] Ibid.
[150] Andrew Restuccia, "White House Climate Strategy Hits Its Stride," Politico, June 22, 2015, http://www.politico.com/story/2015/06/white-house-climate-strategy-hits-its-stride-119310.html.

emissions from power plants are doing so without input from the DOE. This highlights not only the fragmentation of authority over energy policy in the U.S., but also the vulnerability of the new greenhouse gas emission cuts are to differing political agendas and priorities. In 2017, there is no guarantee that a new administration will continue with these cuts, especially given Republican opposition to the EPA in general and the new EPA rules in particular.

The Department of the Interior (DOI) is also a central driver of U.S. energy policy, and like the EPA, it is also making decisions independently of the DOE. The DOI is responsible for all public land in the U.S., and manages about 500 million acres. From these public lands, the U.S. produces energy, both fossil and renewable. New advances in drilling have increased U.S. oil production to its highest point in 20 years. The DOI has also proposed new offshore drilling in both the Atlantic coast and the artic. For the DOI, it must now balance energy production with conservation, a task that it might not be able to manage, since the agency has not yet produced a long-term strategy for energy development and usage. The task of long-term energy strategy and planning should be under the DOE.

The EPA and DOI were chosen to illustrate the major policy impacts that agencies other then the DOE were having when it comes to developing national energy policy. The policy decisions being made at both the EPA and DOI have a far larger impact on energy policy than anything the DOE has contributed. This is also the problem that underscores what little affect the DOE has on developing national energy policy.

The two agencies above were also selected for examination to highlight a long-held criticism of U.S. energy policy: it is often inconsistent and contradictory.

While the EPA is pushing aggressively, with the support of the current administration, to cut greenhouse gas emissions, the DOI, also with support form he current administration, is expanding offshore drilling in the Atlantic and in the Artic, while also opening up more federal land for fossil fuel development. This is the contradiction in U.S. energy policy: while pursuing policies that cut U.S. greenhouse emissions, the U.S. is also pursuing policies that have increased U.S. fossil fuel production to their highest levels in 20 years.

It is in this type of situation that a strong DOE is needed, and should have the authority to craft and coordinate a cohesive, long-term U.S. energy policy. However, until there is a solution to the structural fragmentation and short-term shifting policies that plague the ability of the U.S. to develop a national energy policy, the U.S. will have to come to terms with having a weak DOE, that is not focused on energy policy, and is not the driving force behind U.S. energy policy. Instead of focusing on conceptualizing 'energy security' and developing a long-term strategy to secure the energy future of the U.S., the DOE is focused instead on the U.S. nuclear weapons stockpile.

Conclusion

This chapter sought to answer the following question: What affect does the U.S. Department of Energy have on U.S. energy policy? The proliferation of agencies and

Congressional committees with oversight of energy policy makes it difficult for any single agency to have a role in developing a cohesive and coordinated national energy policy. Combined with our political system of divided government and short-term shifting policies, and the answer is obvious. The U.S. Department of Energy has little ability to affect the development of national energy policy, in either the short-term or the long-term. Simply put, the DOE simply does not have the statutory authority over the policy areas it needs to in order to coordinate long-term energy strategy development. The aforementioned agencies that currently have more affect in developing U.S. energy policy are not tasked with nor designed to address the long-term strategic energy needs of the nation. Nor are the aforementioned agencies prepared to conceptualize 'energy security' and lead a coordinated energy strategy. Based on the analysis of this chapter, it is clear that the current mission, budget, and authority of the DOE is inadequate for the agency to fully develop and coordinate a national energy policy for the U.S. However, despite the repeated failures of administrations past and present to grapple with the need for a long-term energy policy that identifies the nation's energy security needs and challenges, there is little to no evidence to support the premise that reform is needed, and to do so would mean taking concrete steps to streamline policy authority in favor of a stronger DOE.

Thesis Conclusion

This thesis has explored the effects of not having a single definition or conceptualization of the term 'energy security' on U.S. energy policy in order to test a hypothesis that assumed that without such a single concept to guide U.S. energy security strategy, U.S. policy would be divided and incoherent. The research presented throughout this paper has proved this assumption to be correct. From infrastructure development in Chapter 1 to defense policy Chapter 2, there has been an abundance of evidence to demonstrate that without a common concept, definition, or agreeable objective regarding energy security, U.S. energy policy is inconsistent and lacks long-term vision. Moreover, despite the number of agencies with the influence to shape national energy policy, the one agency that should be leading U.S. energy policy paradoxically has not been in the lead in developing national energy policy. The analysis of Chapter 3 demonstrated that the U.S. DOE is not prepared to coordinate a cohesive energy strategy centered on the concept of U.S. energy security.

There are several areas that additional studies would be welcome to continue the analysis presented in this thesis. First, the difference in energy policies pursued by different federal agencies has been observed as inconsistent. However, the difference in energy policies and concepts pursued by 50 individual states are surely as different, and may conflict with federal energy policy. Future scholars of this topic would be well advised to conduct an analysis of the potential conflict between energy policies at the

state and federal level. Such an analysis, which could include an exploration of authority fragmentation, or a lack of fragmentation, and divided government at the state level, would be a useful addition to the existing body of work regarding the formulation of a national energy policy.

Second, while the U.S. does not have a conceptualization of energy security, there are other countries that have conceptualized, defined, and have a long-term strategy for their energy security strategy. In November 2012, the Department of Energy and Climate Change in Great Britain release a strategy document entitled "Energy Security Strategy."[151] The document conceptualized the issue of energy security, and laid out a long-term vision for securing Britain's energy future. An analysis of Great Britain's energy security, juxtaposed against the U.S., using measurable objectives, would be a useful analysis in measuring how effective national energy security policies are. While this thesis was narrow and focused exclusively on the U.S., a study of how different nations have conceptualized energy security would be a useful addition to this body of work.

Finally, April 2015 saw the release of the first ever Quadrennial Energy Review (QER). While this thesis did not explore the policy effects, recommendations or implications of the QER, the analysis in this thesis demonstrated the need for a regular review of U.S. energy policy. An area of future study would be to focus on the QER, and its ability to affect change in the way U.S. energy policy is formulated and coordinated.

[151] Department of Energy & Climate Change, "Energy Security Strategy," November 2012 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/65643/7101-energy-security-strategy.pdf.

An analysis of the QER's recommendations, pared with the finding's of this thesis, would be a valuable contribution to the body of work on the effects of inconsistent, non-cohesive, and un-coordinated energy policies and their effects on the ability of nations to increase their energy security.

Additional studies aside, this thesis demonstrates that U.S. energy policy lacks coordination and a long-term vision. As long as decision making over energy security policy is fragmented over a plethora of agencies and committees, each with their own narrow political or special interest driving them, the prospect of the U.S. increasing its energy security will continue to remain elusive. Despite the need of an over-arching policy and a conceptualization of energy security for the future, officials at the highest level have clearly acknowledged the problem of fragmentation that prevents a national energy policy from taking shape, as evidence in Chapter 3 demonstrates. It is apparent that the current process and structure in place for deciding national energy policies is woefully inadequate.

There are clear obstacles to reforming U.S. energy policy and the process through which it is determined. The willingness of the political leaders to settle on a concept of energy security that is right for the nation is perhaps the prevalent obstacle to getting a national energy policy in place. This would also entail breaking the four-year election cycle that often signals the shift or change in energy policies from one administration to another.

Despite these challenges, the analysis presented in this thesis identifies opportunities to reform U.S. energy policy, and give it the cohesion and coordination that is needed to increase U.S. energy security. The need for this conceptualization and long-term strategy has been noted by both prominent scholars and by intergovernmental organizations. One leading scholar on the topic of energy security, Daniel Yergin, has stated the need for the U.S. to decide the pace and scale of domestic energy development as well as the mix of energy resources that will compose what we use.[152] The International Energy Agency (IEA) has also identified the lack of a long-term strategy and policy hurts U.S. energy potential, and poses environmental risks.[153]

With a review of U.S. energy policy currently under way with the QER, U.S. officials should now consider making reforms to energy policy. Given the number of agencies with a role in influencing energy policy, it is believed that both political parties would be receptive to streamlining and eliminating some of the redundancy that currently inhibits the formulation of a national energy policy.

First, the DOE budget should be re-prioritized to reflect its mission of increasing the energy security of the U.S. Responsibility for maintaining the nation's nuclear weapons should be transferred to an agency that is more suited to handling defense activities. The DOD would be an agency that is well equipped to deal with nuclear weapons. This would allow the DOE to re-focus its budget on developing an energy security strategy, and allow more coordination and oversight of national energy policies.

[152] Clifford Krauss, "Bigger than Either of Them?" New York Times, October 23, 2012.
[153] Jared Gilmour, "US Energy Policy Review Reveals US Doesn't Have an Energy Policy."

Second, the number of agencies with oversight of energy related issues should be reduced, transferring those oversight responsibilities to the DOE. Strengthening the DOE should be the key of any reform effort. Currently, the DOE is perhaps the federal agency with the least influence over energy policy, despite it being the only agency with 'energy' in its title. Strengthening the DOE will allow for a more coordinated effort at national energy policy, while perhaps also reducing the amount of contradictions that are currently in U.S. energy policy. With a single agency overseeing national energy policy, it would perhaps then be possible to enact a national energy security strategy.

Given the complicated political, economic, environmental and security issues that underlines U.S. energy policy, any attempts to reform U.S. national energy policy will be difficult. However, given that the U.S. has lacked a long-term strategy for its energy security, reforming our energy strategy now could pay significant dividends in the future, as the competition for scarce resources and the effects of climate change continue to be felt. Rather than continuing down the same path of wondering what to do about energy every four years, perhaps now is a time to reform energy policy, conceptualize energy security, and enact an energy security strategy that will guide us into future.

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